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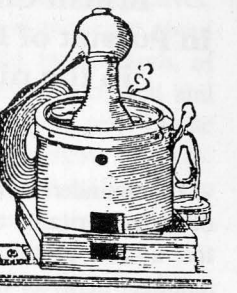

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OBITUARY.

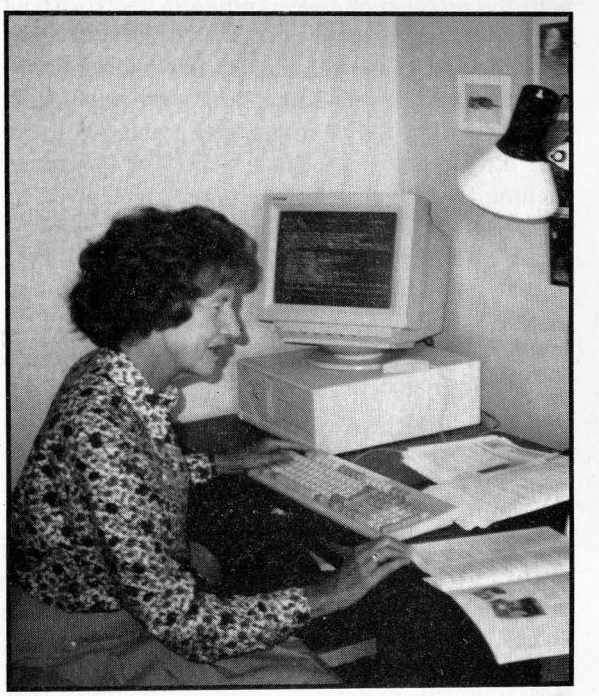
Kenneth Holland

It is with regret that we record the death on New Year's Day at the age of 81 of Kenneth Holland, FRPharmS, a committee member of our society. He was born in Dorset but lived for most of his life in Essex. Registering as a pharmacist in 1938, Ken was experienced in hospital and community pharmacy before joining the Royal Air Force medical branch as a dispenser. Taking part in the Normandy landings, Ken was with the Allied forces in France, Belgium, Holland and Germany and rose to the rank of flight lieutenant. After the war employment with May & Baker, initially in production but then as a medical representative, took him to Essex. He joined Macarthys of Romford in 1948 in wholesaling operations, eventually becoming managing director of Macarthys Laboratories Ltd. Following 22 years with Macarthys he set up his own export business and also acquired four community pharmacies. Retiring in 1983 he began a writing career and was a frequent contributor to the pharmaceutical press, writing over 50 'profiles' of pharmaceutical companies and personalities. He was a familiar figure at evening meetings and annual conferences of BSHP and a valued member of its committee. Few pharmacists have enjoyed such a varied and successful career. He will be sadly missed by his friends and colleagues.

John Hunt.

THE INDEX

Readers will be relieved to know that we are making a comprehensive index for all the *Pharmaceutical Historians* up to and including volume 25. This arduous task has been taken on by Mrs Jean Runciman who can be seen here working at her computer.



MYSTERY PHOTOGRAPH IDENTIFIED

The photograph taken from Dr. W. Helfand's post-card (our apologies for writing his name incorrectly) has been identified. Our president, John Hunt, was the first to get near the truth, the shop was not a pharmacy but a drug-store at 17, Spencer Street, Eldon Lane, Bishop Auckland, Durham. The appearance of the shop, the style of lettering and the gas lamp suggests the photograph dates from the 1920s. The business however did later become a pharmacy, appearing on the Register in 1935 (the first year such a register was published) as "Peverell's Chemists Ltd."

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British Chemists & Druggists in Pursuit of Pharmaceutical Science in the nineteenth century.

Dr J.Burnby.

The founders of the Royal Pharmaceutical Society of Great Britain, established in April 1841, only too aware of the lack of scientific knowledge amongst many of its members, were determined to rectify this. The moving spirit was not the president, William Allen, but a much younger man, Jacob Bell. Less than three months later he began what he called his 'Scientific Meetings' in his own home which were reported in full in *The Pharmaceutical Journal and Transactions* of which he was editor. The first lecture was given by Dr Alexander Ure, M.D., on tests for Hippuric Acid and its use in gout, followed by Theophilus Redwood who dealt with the problem of concentrating extracts without causing decomposition.

By the end of the year the Society had leased its own premises the well-known 17 Bloomsbury Square in London and the meetings were tranferred there. The next step was to start a School of Pharmacy. Preliminary 'Introductory Lectures' were given by Redwood, Drs. Pereira, Thomson and Ure, and the young chemist George Fownes. On 16 February 1842 A.T.Thomson, M.D., F.L.S. defined and spoke on materia medica, and on 2 March Andrew Ure, M.D., F.R.S., on pharmaceutical chemistry saying that since the death of Paracelsus it had always formed a branch of a good medical education. On 16 March it was Theophilus Redwood's turn when he emphasised the necessity for uniform preparations and the improvement of pharmaceutical processes. Jonathan Pereira, ever a popular speaker, talked about recent discoveries on 30 March, and George Fownes three weeks later "On the ultimate analysis of organic bodies" using pure crystallised sugar as an example.

The four lecturers, Fownes, Pereira, Redwood and Thomson were next appointed and the School opened on 17 May 1842. It was immediately successful with forty students of all ages enrolling for the first course, and with some ups-and-downs has continued to be so throughout its history.

This was all very well for the capital but was scarcely much help for those who lived in the more distant parts of Britain. It was George F. Schacht of Clifton, near Bristol in the West Country, who taking a leaf from the British Academy for the Advancement of Science, made the suggestion that meetings lasting several days should be held annually at different places in Britain. The Society was just then embroiled in the Pharmacy Act of 1852, the new by-laws and subsequent unfortunate law suits, consequently nothing was even considered. Worse still, Jacob Bell died in 1859 when only 49.

The idea was not forgotten however. In 1863 two enthusiastic young pharmacists, Henry Bowman Brady and Richard Reynolds who had known each other during their apprenticeships in Leeds and had both successfully passed the higher examination (known as 'the Major') of the Pharmaceutical Society, revived the scheme.

By means of a notice in the *Pharmaceutical Journal*, they proposed that a meeting should be held during that of the British Association for the Encouragement of Science at Newcastle-upon-Tyne in August of 1863 at which they would discuss how the various provincial Pharmacy Associations could be strengthened, and in particular that an independent conference should be established for the advancement of British pharmacy in the scientific field.

The initiators were highly practical men because they pointed out there would be no costly outlay, no salaries and no publishing department, and above all that the railways offered return fares at the single price provided one joined the British Association which cost a pound sterling. The pharmaceutical meeting took place on 2 September at which 25 pharmacists were present. Henry Deane, an experienced microscopist, was made chairman, Barnard Proctor talked about weights and measures which were then by no means standardised, and Richard Reynolds on adulteration, an ever pressing problem.

In short the meeting was a great success, and the British Pharmaceutical Conference, still an important date on the calendar for the pharmacist, was born.

The following year there were 150 members, and at Birmingham the year after there were more than 300. By 1871 when the Conference was held at Edinburgh there were 1,900 enrollments. One of the strengths of the Conference was that not only members of the Pharmaceutical Society were welcome, but also those of a rival organistion, the United Society of Chemists & Druggists, (which belied its name as it was far from united and died after the Poisons and Pharmacy Act of 1868), those who belonged to no society, foreign pharmacists such as De Vry from Holland and doctors with an interest in pharmacy, chemistry or botany.

At Bath in 1864 there had been 28 papers, the subjects ranging from accidental poisoning to one given by F.Baden Benger (of Benger's Food fame) on the applications of glycerin which was then

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something of a novelty. Barnard Proctor at Birmingham (1865) spoke on emulsions and demontrated both oil-in-water and water-in-oil types. Professor Bentley was President of the Conference at Nottingham (1866) and, as was only to be expected because he lectured on the subject, spoke on the importance of botany and the problems of substitution and adulteration. In contrast, W.W.Stoddart, a pharmacist and a Fellow of the Chemical Society, when President at Edinburgh in 1871,said chemistry was more important than botany and noted the welcome addition of chloral hydrate to medicine. The year before at Liverpool he had spoken on chemical syntheses which made the terms organic and inorganic meaningless.

At this Liverpool Conference a paper came from Australia. John Hood had been trying to grow *Papaver somniferum* for opium production but so far had not attained a higher percentage of morphine than 4 to 7 %, inspite of trying various methods of cultivation, whilst William Martindale the future author of that invaluable book, *The Extra Pharmacopoeia*, discussed the ideal pill excipient.

It was in 1869 that the Conference decided to reverse its earlier ideas on publications. *A Year-Book of Pharmacy* was to publish the principal results of original work and also abstracts of current literature. A print-run of a 1,000 copies was agreed but in fact had to be doubled. The first editor was a Mr Brough who conducted the *Chemist & Druggist's* "Corner for Students". He was unfortunately taken ill and the work had to be taken over temporarily by his friend Joseph Ince, (1826-1907) a great bibliophile. The next editor, chosen from eight applicants, was Louis Siebold, lecturer at the Manchester Chemists' Association School of Pharmacy, a post he held for 27 years. By 1872 at Brighton it was agreed that *The Year-Book* was a success and met a real need with its summaries of all that was new in pharmacy.

It was reported in 1874 that presentation copies of the *Year-Book* were made to those provincial associations which had libraries, fourteen in all, and that exchanges were made with the editors of journals in the USA, Jena, Antwerp, Munich, Paris and Fürstenberg-on-Oder.

At the Exeter Conference of 1869 T.Hyde Hills gave 50 guineas in his own name and that of the late Jacob Bell for the purchase of books; ten guineas of which was given for additional books for the local the chemist & druggists' library. Three years (1872) later at Brighton, Hills gave another £200 to the Bell and Hills Library Fund. However, at least for a period some of this money was diverted for a very important aspect of the Conference's objectives.

Since 1863 the Conference had proposed about 200 subjects which were suitable for research, of which about a hundred had been investigated and had resulted in a third of the papers read in the meetings held up to the one at Glasgow in 1876. In order to encourage and financially help researchers small grants were made to them from the Library Fund.

T.B.Groves of Weymouth, whose great interest was botany, for several years was awarded £10 for his work on the aconitines, and Professor C.R.A. Wright, D.Sc. for that on the opium alkaloids. A.W.Gerrard pharmacist at Guy's Hospital,and later of University College Hospital, received grants for his work on pilocarpine and its salts as well as for his contributions to the preparation and use of plasters.[4] In 1876 at Glasgow, grants to a total of £75 in aid of eight research projects were authorised, the recipients including Dr H.E.Armstrong for the purchase of strychnine in whose chemistry he was interested, and Dr W.A.Tilden who was working on the aloins and essential oils.[5]

Current problems and changes in the British pharmaceutical world were not infrequently discussed as well, such as the status of the pharmacist, or the new but unsatisfactory *British Pharmacopoeia* of 1864. It was the first attempt at amalgamating the three pharmacopoeias of London, Edinburgh and Dublin, and had to be replaced in 1867. The Poisons and Pharmacy Act of 1868 was considered at Norwich in that year, clause by clause, including a controversial 'Modified Examination'. In 1872 John Attfield was highly critical of the Act, saying that the old 'Minor' examination, once just for assistants, was now the one for principals of pharmacies. This had led to the undesirable practice of "cramming" for the examination.

Worse in fact was to come with the establishment of some private schools of pharmacy which boasted that they could push a student through this examination in a mere six weeks. All he had to do was learn by heart the answers to about a hundred questions which were the ones most likely to be asked.

John Attfield (1835-1911), as a student at the Society's School of Pharmacy had gained in 1854 medals for chemistry, pharmacy, botany and materia medica, and in 1862 was appointed Director and Demonstrator of Chemistry and Pharmacy.[6] For thirty years he campaigned for pharmacy students to be required to present proof that they had studied for a supervised set period at a recognised school of pharmacy.

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And so over the years the Conference saw many men of eminence acting as president, and many more giving valuable papers on their experiments and research work. Its value to pharmaceutical science was undoubted. Then in 1922 jealous eyes were cast on this fine organisation. The great William Glynn-Jones, originator of the P.A.T.A. movement and now secretary to the Pharmaceutical Society, and the President of the Society E.T.Neathercoat, in an abrupt and arbitary fashion announced that the Society intended to take over the Conference. As may well be guessed this produced dismay in many quarters but nevertheless agreement was reached at the Nottingham Conference in September of that year. For many years attendance declined but on the other hand the scientific status of the British Pharmaceutical Conference grew as it emphasised that pharmacy was a scientific discipline.

The Year-Book in 1928 was incorporated into a quarterly journal which later became the monthly prestigious *Journal of Pharmacy and Pharmacology.*

For our own particular subject, the history of pharmacy, the Conference has for the last twenty years and more given us a splendid opportunity to advertise our subject. We are given one afternoon in each Conference where we are able to give two full length lectures, and in more recent years set up a display stand. We nearly always have an excellent attendance and gather a number of new members. Nor is that surprising. We have been told that members at least understand what we are talking about and it is a pleasant relief from, say, "Analysis of polymer end groups in charge-stabilised colloids by SSIMS, XPS and electrophoretic mobility measurements" or "Structure-activity relationships in antibacterial aromatic ring fused 4-pyridones".

Notes and References.

1. G.F.Schacht was an old student of the Pharmaceutical Society's School of Pharmacy.
2. H.B.Brady (1835-1891), the son of a doctor in Gateshead was elected to the Pharmaceutical Society in February 1856 having passed the 'Major' examination in July 1855. A fine microscopist, he wrote many papers on the subject and became an authority on the *Foraminifera*; he retired in 1876 in order to help with writing up the scientific results of the *H.M.S. Challenger's* three year voyage. He became a Fellow of the Royal Society.
   R.Reynolds (died 1890) passed the 'Major' in the summer of 1851, was elected to the Pharmaceutical Society in June 1854 and the same year joined Thomas Harvey of Leeds. Harvey had taken over in 1841 from William West, also an FRS, who had founded the pharmacy in 1816. See, *Chem.Drugg.*, 31 Jan. 1920, p.74.
3. John Hood was born in Antrim, Ireland on 1 November 1819 and arrived in Australia on 18 June 1840. Within only a few years, he became the owner of what is thought to have been the oldest pharmacy in Melbourne. Later he became a Member of the Legislative Council and a founder member of the Pharmaceutical Society of Victoria, established in 1857. See, *Aust. Jnl. Pharm.*, 30 Sept. 1957, pp.1037-8.
4. A.W.Gerrard (1844-1925), as Leslie Matthews has put it, "distinguished himself by acting as his own guinea-pig in swallowing an indeterminate quantity of pilocarpine which he had extracted from jaborandi residues. This resulted in a near-fatality but he continued his experiments and went on to isolate the alkaloid." After leaving U.C.H. he was in retail from 1894 to 1898 and in 1899 joined with John Cuxson to form Cuxson,Gerrard & Co. Ltd., of Oldbury, to manufacture plasters and surgical dressings.
5. William Augustus Tilden, (1842-1926) had been in 1861 one of the first two to be awarded a Jacob Bell Memorial Scholarship. He was for nine years a demonstrator at the School of Pharmacy under Professor Attfield, during which time he passed both B.Sc. and D.Sc. examinations, and in 1880 was elected an FRS. Later he became Professor of Chemistry at the Royal College of Science, contributed to the *Pharmacopoeia* of 1898, and was knighted in 1909.
6. The title was later changed to Professor of Practical Chemistry. It was the same year as he gained a Ph.D. of Tübingen.

This paper was given at the International Academy for the History of Pharmacy Conference held at Stockholm in June 1997.

Review

Apotheker-Kalendar. Calendar for Pharmacists. 1998.

Once again Drs. Wolfgang-Hagen Hein and Werner Dressendürfer have produced a magnificent calendar. The illustrations range from the interior of an eighteenth century pharmacy to mediaeval distilling apparatus, from the symbolism of the Pharmacist fighting Death to the almost inevitable Saints Cosmos and Damian. The cover and the month of January depict the well known caricature of Thomas Rowlandson in which a flourishing 'quack' is dispensing for his afflicted patients who appear close to death - and far from hopeful.

There are twelve colour plates, one for each month of the year, which surely must bring pleasure to all pharmacists with any interest in the historical background to their profession. The colour values are first class and the information on the back of each picture gives a short history of the painting or piece of equipment, including the provenance, dimensions and a bibliography.

Orders for the calendar should be sent to the Deutscher Apotheker Verlag, Postfach 10 10 61, D-70 009 Stuttgart, Germany. Price 48 D.M.

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Prescriptions on Stamped Paper - an eighteenth century suggestion.

The late Leslie Matthews.

(The Editor some years ago when helping Mr Matthews to sort out his papers in a large filing cabinet found one dating from the spring of 1969. Today, as we well know, the N.H.S is coming under increasing economic pressure but it seems to be by no means the first time.)

During the pre-Budget period the Chancellor of the Exchequer gets many suggestions for raising revenue, ideas sometimes promoted by correspondents who would prefer the adoption of their scheme to any already in operation and which indeed may incommode them.

James Woodman, early in the eighteenth century thought the revenue could be supplemented if physicians' prescriptions were written on stamped paper. He submitted this proposal on 18 June 1714 to The Most Honorable Robert, Earl of Oxford, Lord High Treasurer of Great Britain. Robert Harley had served as High Treasurer to Queen Anne for many years. Woodman's letter is in these terms:-

"S^{r},

I humbly presume that 'tis now a proper Season to lay before yr Honr a Proposal of the following kind, it being such as will immediately Raise a very considerable Summe to the Government without any Charge of Collection. And upon a Subject never Toucht (vizt.) Proposed -

Imp^{rs} That every Gent. professor of Physick that shall give a Prescript for the fee of 4 pounds or upwards, shall make the same upon a Sheet of paper Stamped with a Stamp of 10s. And for every Prescript made for a fee of 40s. and upwards, the same shall be made upon a Sheet of paper Stamped 5s. And for every Prescript made for a fee of 20s. & upwards the same shall be made upon a Sheet of paper Stamped 2s.6d. And for every Prescript made for a fee of 10s. & upwards the same shall be made upon a Sheet of paper Stampt is. under a penalty of ——.

2^{d} To prevent any fraud or mistake in the Means above said. Be it enacted that no Apothecary, Chymist etc. do presume to make up or Compound any Physick to or by any prescript whatsoever without it be upon some one or other of the above said Stampt Sheets, upon which or any of the said Sheets shall be but one prescript, under the penalty of — upon such Apothecary, Chymist —to the Queen and —to the Informer.

3^{dly} It will be convenient to place the said Stamps in some uncommon part of the Sheets that the same may be to no other use than that of the physitians, by which means the full Income of this proposal may be known for a Shorter or Longer time.

4. It is considered that by these Means all those learned Gent^{n}. the professed Physitians will gain an Absolute Conquest over all Quacks & Ignorant pretenders that have Usurpt over the noble profession and rendred the whole body of Physick Ridiculous for many Years past.
5. It is certain that every Patient will take care to have a Stamp equal to his fee given, for the physitian must now ask what Stamp must be used & so the fee is known at the first & before hand, ... Note all physitians must stand prepar'd with Stamps.
6. The Apothecarys will be bou(n)'d to swell their files with such hon^{rble} prescripts and not be stuff'd out with Quackish devises.
7. Nothing in this proposal depriveth the Poor from any prescript that would be given Gratis, for any one will pay the 12d. Stamp, if the Physitian don't please to give it.

Lond^{o} Dat^{s} 18 June 1714

Soe, S^{r}. I leave it to your hon^{rs} Judgment, & if it hath Effect, humbly submit to your hon^{rs} to take care for my Interest in it, being

Yr most Obedient Serv^{t}

James Woodman.

(Mr Matthews' comments on the proposal.)

The value of the stamp, to be affixed by the physician, was to be related to the fee charged; this the patient was to ascertain beforehand. Who should pay for the stamp, whether the physician out of his fee or the patient by an increase in the fee, is not mentioned. Penalties were to be exacted, the amounts (unstated) to be shared by the Queen and the informer. (This was a period when many statutes brought rewards to informers.) Who was likely to inform - the patient or the apothecary or the chymist who made up the prescription ?

Woodman, so he says, was on the side of the physician who by this means was to "gain an absolute Conquest over all Quacks and Ignorant pretenders". How a quack could have been prevented from buying the special stamps is not recorded - presumably the Administration would have had to deal with this problem.

The proposal obviously did not commend itself to the High Treasurer, although the records do not include any acknowledgment to Woodman. Even his point that this revenue-raising scheme was "... without any charge for Collection" did not secure its adoption. It has been left to our age - more than 250 years later - to require an unexempted person to find the 2s.6d. needed when his prescription is dispensed under the N.H.Service.

(The transcript (T 1/177) in the Public Record Office appears by permission of H.M. Stationery Office.)

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William Walter Stoddart, Ph.C.: the first public analyst for the City of Bristol.

F.H.Rawlings.

William Walter Stoddart was born in Freshford, a village near Bath on 24 February 1824. His father, a partner in an extensive clothing firm, soon moved to Kidderminster where young Stoddart was educated. His interest in chemistry, which he practised in his bedroom, on one occasion caused an alarming midnight explosion arising from an attempt to make phosphuretted hydrogen.

Leaving school when sixteen, his father insisted he was placed in a carpet manufactory where he learned the routine of weaving and dyeing, whilst he continued his chemical experiments. Three years later, he had his wish fulfilled and became a pupil of William Hodgkinson, Ph.C. at 127, Aldersgate Street, London, E.C. This was followed by six years with Messrs. Steele & Smith in Bath before he began to practise in Bristol. There he took over the business of John Martin, (Dispensing Chemist, 1843-1852) at 9, North Street in 1853. Here he developed his interest in analytical chemistry. He is listed in the Bristol directories as a "Family & Dispensing Chemist" in 1853-69, and from 1870-76 as a "Family & Analytical Chemist".

STODDART'S
SEA SALTS
9, NORTH STREET.
STODDART Wm. W. family and dispensing chemist, proprietor of Humpage's medicated syrup of Horehound, 9 North street

He joined the Pharmaceutical Society in 1853 and became a Council member in 1868 serving on the Financial and the Benevolent Fund Committees until 1875 when the pressure of his work became too great. He was an active supporter of the Bristol Pharmaceutical Association becoming secretary and president on two successive occasions when he gave the presidential address. The second period of office was followed by a course of scientific instruction in materia medica, chemistry and botany of the Pharmacopoeia given to about twenty young pharmacists and students who presented him with an illuminated address.

The British Pharmaceutical Conference.

The first suggestion for this scientific meeting was made by G.F.Schacht in 1852 at the Bristol Pharmaceutical Association, and came to fruition in Newcastle in 1863. At the Bath Conference of 1864, Stoddart read a paper on the "Purity of the Sulphate of Quinine in Commerce", in which he stated he was able to detect the impurities of quinidine or cinchonidine in quinine in quantities as small as 1/10,000th. of a grain.

At Dundee in 1867, his paper was "Notes on the use of the microscope and oits crystallographic application"; in 1868 at Norwich, when Daniel Hanbury was president, he read two papers, "Honey, its formation and changes" and "Lemon Juice and its decomposition". The latter was particularly important as the Board of Trade had passed a Shipping Act stating that every foreign-going ship should provide as much lime or lemon juice as that each man would have at least one ounce per day as soon as the vessel had been ten days at sea, and that a sample had to be examined by a special officer. This caused consternation amongst the merchants. Not an ounce of the genuine juice could be bought in Liverpool, Birmingham or Bristol, many samples were artificial, some just dilute sulphuric acid.[1]

At the 1869 Conference in Exeter his paper was titled, "The application of Spectral Analysis in pharmacy", a method of analysis discovered by Kirchhoff and Bunsen in 1860. Stoddart listed detailed results for many pharmacopoeial preparations including tinctures, fluid extracts, liquors, solutions and medicated wines.

Walter Stoddart was president of the Conferences held at Liverpool in 1870 and Edinburgh the following year at which he gave the usual presidential addresses. During his first presidential year, the Chemist and Druggist wrote of him, " Nothing need be said as to the active interest taken [by him] at every meeting since its inauguration at Bath, [he] is too well known to members generally, and that, too enhanced by the friendly relation in which he stands with his fellow-pharmacists", and "He owes his position to painstaking and never-wearied industry. He has upset the theory that business and science are incompatible".[2]

In 1872 at the Brighton Conference he presented a joint paper with Mr R.L.Tucker on "The wines and tinctures of the Pharmacopoeia" which caused discussion concerning the shape and method of packing percolators. His paper at the 1875 Bristol Conference was "Pharmaceutical experiments on the Bristol Rocks". Even in 1879 in Sheffield when his health was failing, he presented a paper on the "Growth and development of Claviceps purpurea".

The Bristol Naturalists' Society.

On 8 May 1862 a meeting of like-minded people met to discuss the founding of the Bristol Naturalists' Society and a provisional committee

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was formed which included W.W.Stoddart. At the first meeting he was elected treasurer and became vice-president in 1879 when he was president of the Geology Section.

During the 1870s he had published a series of papers in the Proceedings of the BNS on the geology of the Bristol coalfield, and also on the geological distribution of Bristol mosses. During the same period, he provided the finances for the inclusion of plates and woodcuts in the Proceedings. In 1901 his collection of carboniferous fossils was presented to Bristol University College.

He as a Fellow of the Institute of Chemistry, and of the Chemical and Geological Societies, and no doubt contributed articles to their publications.

Public Analyst.

There are no official records of when he became the Public Analyst for the City and County of Bristol, although so listed in the directories from 1876. During the last five years of his life he became the Public Analyst for Bristol, the county of Somerset, the city of Salisbury and the boroughs of Bridgwater, Chard and Devizes.[3]

Early records show that the analyst was concerned with water supplies, testing and condemning wells, checking the water supply through the various conduits and the water company supply. Twice he recommended that the water company should filter the water before delivering it to the mains. He also regularly checked the quality of the gas supplied by the gas company for street lighting.

He wrote a series of articles for the *Pharmaceutical Journal* on Bristol pharmacology dealing with local medicinal plants. J.W.White, another Bristol pharmacist, in the foreword to his *Flora of Bristol* writes of Stoddart's "geniality, kindliness and sympathy" and that "he found time amid the press of his analytical and geological work ... were he ever so busy, the task of the moment was always cheerfully put aside in the interest of the visitor who wished to consult him upon any matter that lay within the bounds of his wide knowledge."

He died on 30 May 1880. When G.F.Schacht reported his death at the Society's council meeting of 2nd. June, the Chairman Mr Sandford said that, "The Pharmaceutical Society had lost one of its brightest ornaments." The *Chemist and Druggist* on 15th. June published a two-page obituary. The British Pharmaceutical Conference on 24th. August recorded a special resolution of regret and praise.

A more telling note was from "The members of the Bristol and West of England Dairyman's Association respectfully offer[ing] sincere sympathy and condolence to Mrs Stoddart and family in their recent severe bereavement, and ask[ed] acceptance of this address as a small tribute to the probity and conscientious impartiality of the deceased gentleman."

His son, Frederick Wallis Stoddart, succeeded his father as public analyst in 1884. With such a record of achievement, it is obvious that W.W.Stoddart was one of the founders of scientific pharmacy.

References.

1. *Chem.Drugg.* 15 June 1880, p.232.
2. Ibid., 15 August 1870, p.226.
3. *Pharm.J.*, 19 June 1880, p.1030.

Lectures and Articles by W.W.Stoddart.

British Pharmaceutical Conference

1864	**Bath** "Purity of the Sulphate of Quinine of Commerce"
1867	**Dundee** "Notes on the use of the Microscope and its Crystallographic Application."
1868	**Norwich** "Honey, its formation and changes" "Lemon Juice and its decomposition."
1869	**Exeter** "The Application of Spectral Analysis in pharmacy".
1870	**Liverpool** Presidential Address.
1871	**Edinburgh** Presidential Address.
1872	**Brighton** "The Wines & Tinctures of the Pharmacopoeia."
1875	**Bristol** "Pharmaceutical Experiments on Bristol Rocks"
1879	**Sheffield** "The Growth & Development of *Claviceps purpurea*"

Pharmaceutical Journal.

1864/5	"Commercial Sulphate of Quinine."
1866	"Nature and properties of heat practically applied."
1867	"Use of the microscope and its crystallographic application."
1868	"Honey, its formation and changes"; "Lemon Juice and its decomposition."
1869	"The air of Bristol and its analysis"; "Application of spectral analysis to pharmacy."
1870	"Chemistry of sugars." A series of papers on Bristol pharmacology, noting botanical, chemical or pharmaceutical interests in the area including quotations from Greek, Latin and English poets.
1872	(with R.L.Tucker) "Wines and tinctures of the Pharmacopoeia "
1874	"Modification of Liebig's volumetric process for the estimation of Phosphoric Acid." "Horsley's Lactometer."
1876	"The physics of filtration and evaporation"; "The colouring matter of *Crocus sativus.*"
1877	"Impurity in Zinc Oxide."

The Geological Society.

"The Lias formation of the Bristol neighbourhood."

Bristol Naturalists' Society.

1874	"The *Desmodiae* of the Bristol neighbourhood."
1874-79	Six articles on the geology of the Bristol coalfield.
1876	"On *Ceratodus forsteri*"; "On the geological distribution of some mosses of the Bristol coalfield."
1877	"Notes on metals found near Bristol."
1878	"Fossil bones of the Water Vole."

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From Poor Law to National Health Service

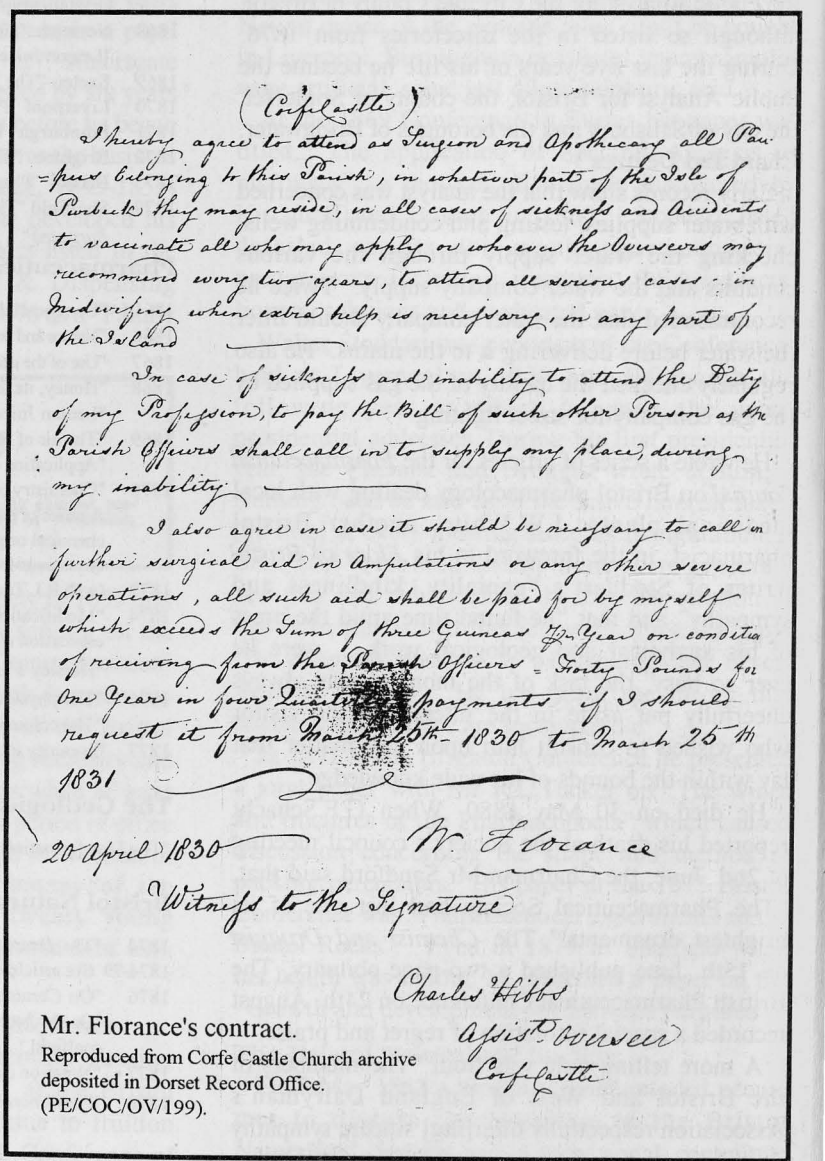
by J. A. Hunt

The old Poor Law

In seeking the origins of State health care we need to go back to the various Poor Laws which were in force over several centuries and indeed until quite recent times. Early acts dealing with paupers and vagrants go back to the fourteenth century, due in part to the social unrest brought about by the Black Death. But for the purposes of medical and pharmaceutical care we can begin by looking at the Poor Law Act of 1601. Enacted during the forty-third year of the reign of Queen Elizabeth I this Act is usually known either as the 'Old Poor Law' or the '43rd of Elizabeth'.[1] The Act made each parish in the Kingdom responsible for the the maintenance of its poor. A clear distinction was drawn between honest folk who had become aged or infirm and thus unable to support themselves, and the able-bodied poor who were perhaps less industrious than they might have been, and who should be put to work. The parish poorhouse was probably available for those without alternative shelter, but payments from parish funds were made to those who could be cared for in the homes of family or friends, and this was known as 'outdoor relief'. The able-bodied were likely to find themselves breaking stones to mend the local highways, which were also the responsibility of the parish, in return for a small allowance. Some men would tour the local farms doing a day's work at a time, and they were known as parish roundsmen.[2] The system was managed by the parish overseers.

Care of the sick

Moving to the care of the sick, the parish overseers were required to make provision for ill-health in paupers. An Act of 1782 required overseers to make provision in poorhouses for separate apartments for the sick and where necessary to summon an apothecary or surgeon to provide appropriate treatment. Medical care was also provided where necessary for those receiving 'outdoor relief' in the hope of returning them more quickly to employment. Parish apothecaries or surgeons were appointed by the overseers for the purpose. This made the parish responsible for certain sick persons, at the behest of the State. As can readily be learned from parish records, the parish health worker could be quite fully employed and the costs could become significant by parish standards.[3] Funds were provided from the poor rate which was levied on property owners in the parish. In these arrangements, we see indirect health care by the State, leading much later to direct State health provision.



(Corfe Castle)

I hereby agree to attend as Surgeon and Apothecary all Paupers belonging to this Parish, in whatever part of the Isle of Purbeck they may reside, in all cases of sickness and Accidents to vaccinate all who may apply or whoever the Overseers may recommend every two years, to attend all serious cases in Midwifing when extra help is necessary, in any part of the Island

In case of sickness and inability to attend the Duty of my Profession, to pay the Bill of such other Person as the Parish Officers shall call in to supply my place during my inability

I also agree in case it should be necessary to call in further surgical aid in Amputations or any other severe operations, all such aid shall be paid for by myself which exceeds the Sum of three Guineas per Year on condition of receiving from the Parish Officers Forty Pounds for One Year in four Quarterly payments if I should request it from March 25th 1830 to March 25th 1831

20 April 1830 W. Florance

Witness to the Signature

Charles Hibbs
Assist. Overseer
Corfe Castle

Mr. Florance's contract.
Reproduced from Corfe Castle Church archive deposited in Dorset Record Office. (PE/COC/OV/199).

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Rules, Orders, Bye Laws and Regulations.

To be observed and enforced at every Poor House to be provided and established under authority of the Act of the 22nd Year of King George the Third.

Item. 3 "That Apartments in the House or Houses to be provided as aforesaid shall be adapted so as to accommodate the Poor who shall be sent thither in the best manner they are capable. That the Governor shall place in the best Apartments such poor persons who, having been creditable housekeepers are reduced by misfortune, in preference to those who are become poor by Vice and Idleness; and that separate Apartments shall be provided for the reception of the sick and distempered poor, and an Apothecaary or Surgeon to be sent for to attend them when there shall appear necessity for it, at the expence (sic) of the Parish or Place to which such poor persons belong." (Extract from document Ref. D/WLC:246, Dorset R.O.)

Note:This extract from an Act of 1782 illustrates a more humane approach to poor relief than is evident in the later Act of 1834. It also offers a clear illustration of the establishment of sick wards and infirmaries under the poor law systems, with an obligation to provide medical services.

The new Poor Law

In the depression which followed the Napoleonic wars the Poor Law provisions became an increasing burden for the parishes to carry. By the early nineteenth century many of the regulations were over two centuries old and designed for a very different sort of society from that in the rapidly industrialising towns, and in the rural areas in the midst of the agricultural revolution. Something had to be done, and a Royal Commission on the Poor Law was appointed in 1832. The result was the New Poor Law, or to give it its correct title, the Poor Law Revision Act 1834. The new law aimed to reduce dependency by making the acceptance of poor relief sufficiently disagreeable to force people onto the labour market. The mechanism for achieving this was called the 'workhouse test'. The Act decreed that 'outdoor relief' would no longer be allocated and that the only way in which support could be offered would be by claimants entering the workhouse. "Except as to medical attention ... all relief whatever to able-bodied persons or to their families otherwise than in well regulated workhouses shall be unlawful." Parishes were required to combine into groups of between twelve and twenty and to establish Union Workhouses.[4] These often forbidding buildings became known as the Bastilles, and soon became a familiar site all over the country.

The object was to persuade able-bodied individuals that work was by far the better option. Which was all very well if work was to be found, but in many localities it was not, although the building of the railways in the mid-nineteenth century, and industrial expansion in towns did alleviate the problem to an extent. No effort was spared to ensure that workhouse life was hard and unpleasant. Men were separated from their wives and children, and inmates were given the most menial of tasks to do, such as picking oakum and breaking up bones from slaughter-houses. The Union Workhouses came to be regarded with horror, and to enter them carried deep social stigma which is remembered to this day. This harsh treatment was often applauded by pillars of the community, for example a clergyman, the Rev. H H Millman testified to the Poor Law Commission:

"The workhouse should be a place of hardship, of coarse fare, of degradation and humility; it should be administered with strictness - with severity; it should be as repulsive as is consistent with humanity...."[5]

The Infirmaries

One result of the transfer of the sick poor from the small parish poorhouses to the large union workhouses was the establishment of sick wards. For example, the Cerne Abbas Union Workhouse, opened in 1837, provided services for no less than twenty parishes and accommodated a maximum of 109 paupers. It incorporated male and female sick wards each measuring thirty feet by fifteen feet, together with a small lying-in ward and and a medical officer's room. Following an outbreak of typhus in 1841 it was criticised by a committee of enquiry for having twenty sick beds in conditions of inadequate ventilation and with no sanitation, and for having no provision for isolation. As a result a detached isolation unit was built.[6] In the larger towns and cities such developments as these resulted in due course in the establishment of Poor Law infirmaries. Many of these remained in operation until World War II and were subsequently absorbed into the National Health Service; most people are familiar with hospital buildings which date from the Poor Law provisions. Many such services were very unsatisfactory, and in 1865 *The Lancet* ran a vigorous campaign to bring the position to the notice of the medical profession, politicians and the general public. Atrocious conditions were revealed in the capital, with lack of sanitation and of trained staff. Many 'nurses' were in fact untrained paupers themselves and medical staffing was wholly inadequate. Voluntary hospitals in London provided 3,738 beds, whereas the city contained over 31,000 paupers, of whom 20,622 were sick or infirm.[7]

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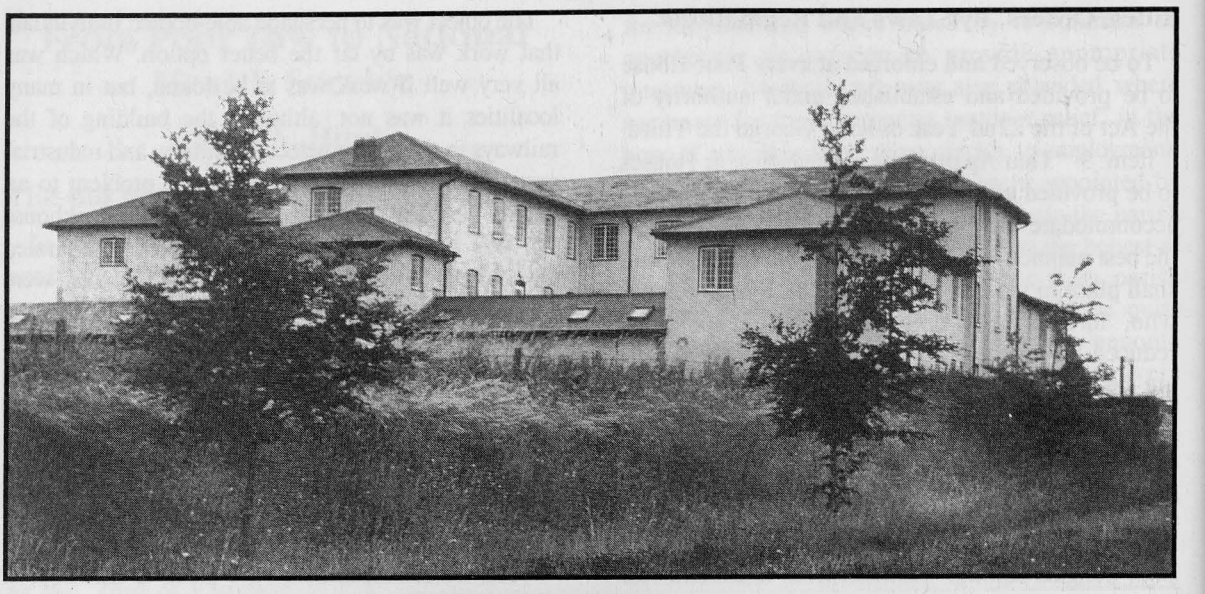

Cerne Abbas Workhouse

The Friendly Societies

Against this background of Poor Law provision, and the revulsion which it engendered in the minds of the working class, there was a very substantial movement of 'self help', which was actively encouraged by authority, as it placed no burden upon the State. The friendly societies had developed rapidly in the nineteenth century. By the year 1900 it was estimated that the friendly societies had over four-and-a-half million members, or about half the adult male working population. There were over twenty-four thousand societies or branches and the two largest societies, the Manchester Unity of Odd Fellows and the Ancient Order of Foresters each had almost three-quarters of a million members.[8] Members made payments of about 4d to 8d per week and this normally provided sick pay of about ten shillings a week together with medical attendance and funeral grants of about £10 to £15, thus avoiding the family disgrace of a pauper's funeral. Many societies had contracts with doctors to provide attendance and medicines for their members. However against a background of too many doctors chasing too few patients these contracts were often very unfavourable to the doctor. As late as 1911 surveys showed many doctors were being paid only four shillings per head per year, to include provision of medicines.[9] Compared with the fees being earned by some parish apothecaries over a century earlier this caused smouldering resentment in the medical profession. And of course where doctors were providing medicines many pharmacies rarely saw a prescription, if at all.

The National Insurance Act, 1911

It is generally accepted that the British Welfare State had its origins in the Liberal governments of 1906 to 1914. Following the resignation of Conservative Prime Minister Arthur Balfour in December 1905, January 1906 saw a Liberal landslide victory with 400 seats and Sir Henry Campbell-Bannerman as Prime Minister, with Asquith as Chancellor. With the death of Campbell-Bannerman in 1908 Asquith became Prime Minister and David Lloyd George became Chancellor of the Exchequer. A radical politician of strong Welsh non-conformist background, he was actively disliked, particularly by the landowning classes, of whom he was very critical. But he was very popular with the masses and in recognition of the welfare reforms which he sponsored, earned the soubriquet 'The Peoples' Champion'.

The Liberal government of the period brought in a remarkable series of reforming measures:

Education (Provision of School Meals) Act 1906
Medical Inspection of School Children Act 1907
Employment of Children Outside School Hours Act 1908
Non-Contributory Old Age Pensions Act 1908
Housing and Town Planning Act 1909
Labour Exchanges Act 1909
National Insurance Act 1911

Lloyd George did not become Prime Minister until 1916 but he is always associated with these reforms. Although he lived to the age of 82 and died in 1945 he never served in government after

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1922. He presented the National Insurance Bill to Parliament on 4th May 1911. This took the medical and pharmaceutical world by surprise. Part I of the Bill dealt with health insurance. It covered employed persons only, earning up to £160 a year, which was the base level for income tax liability at the time. This embraced about fourteen million people out of the UK population of about 42 million. The Bill proposed a weekly deduction from wage packets of 4d., with the employer contributing 3d. and the government 2d. "Ninepence for Fourpence!" in the Chancellor's ringing phrase.

Health Care Arrangements

The Bill proposed that the Friendly Societies should collect contributions and contract with the doctors and possibly with chemists. In fact pharmacists were not specifically mentioned in the Bill. It was for the Friendly Societies to 'make provision' for the dispensing of prescriptions. Doctors would only be permitted to dispense for insured persons living in rural areas. "The first thing to do is to separate the drugs from the doctors,"said the Chancellor in introducing the Bill. The medical and pharmaceutical bodies awoke to 'good news' and 'bad news'. For pharmacists there was at last the hope of securing their proper place as dispensers of prescribed medicines, but there quickly arose the spectre of Friendly Society dispensaries. The larger Societies were quick to propose the establishment of insurance dispensaries, and the Bill made no provision for the qualified supervision of dispensing services. The doctors were to be paid a capitation fee of four shillings per year but would not be required to supply drugs. For the doctors the Bill offered the opportunity to negotiate higher payments, but raised the horror of being made officially subservient to Friendly Society officials, with whom relations were already strained. The *Lancet* was quick to seize on a vital aspect for pharmacy:

"In view of the anomalous condition of pharmacy law this provision appears inadequate to secure that the dispensing of medicines for insurance patients should be done by pharmacists. Dispensing does not necessarily entail a sale, and under the pharmacy acts it is the sale of a poison by an unqualified person and not the dispensing of it which constitutes an offence. There is therefore nothing in the Bill which would prevent societies from making arrangements for the dispensing of medicines by unqualified persons, and such dispensers need not be under the supervision of registered medical practitioners or pharmacists .... Let it be assumed, however, that some clear amendment will be made for the dispensing to be done by qualified persons: this would not necessarily mean that pharmacists in business would be employed for that purpose, for Friendly Society officials have already indicated that they are considering the question of establishing a central drug depot and branch dispensaries for the supply of medicines to insurance patients. If this project is carried out it will be disastrous to a large proportion of pharmacists now in business, especially those in working-class districts." [10]

Negotiations

Doctors and pharmacists entered into lengthy negotiation with government. For pharmacists, the hour of need brought forth the man. William Glyn-Jones moved rapidly to organise support and conduct negotiations. The Pharmaceutical Society had recently emerged from difficult negotiations over the 1908 Poisons and Pharmacy Act. It had recognised the need for effective parliamentary lobbying and fortunately had appointed Glyn-Jones as its Parliamentary Secretary. Glyn-Jones' influence was greatly increased by his election to Parliament as Liberal MP for Stepney in 1910. He visited local pharmaceutical associations and arranged a mass meeting in London attended by a thousand pharmacists. Negotiations were based on the 'seven principles', which included the restriction of dispensing services to registered pharmacies under qualified supervision; freedom from Friendly Society control; the insured persons should be free to choose their own contractor pharmacy; payment against an agreed scale of charges, and pharmacy representation on local health and advisory committees. There is no doubt that pharmacy owes a great deal to Glyn-Jones for securing the right of chemist contractors to dispense National Insurance prescriptions and the requirement for qualified supervision and other benefits.[11] There is good reason to believe that Lloyd George respected Glyn-Jones, both being Welshmen and Liberal MPs of the same generation.

For the doctors, the British Medical Association made a list of demands which included higher payments, patients' freedom of choice of doctor and that doctors who wished to dispense for their own patients should be allowed to do so. It totally rejected proposals that its members should enter into contracts with the Friendly Societies. The negotiations were based on 'the six cardinal points' which had been agreed unanimously.

The negotiations were never satisfactorily concluded, and Lloyd George believed that the BMA negotiators did not really reflect 'grass roots' opinion

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and complained that he only met the 'swell doctors', but never 'the poor doctors or the slum doctors'.

The Government refused to give way on certain points, including the separation of prescribing and dispensing, and raised the threat of a salaried service. Gradually rank and file resistance crumbled, and by the commencement of services under the new Act in January 1913 over 15,000 doctors had signed up under the panel system, organised by local health committees. Never the less, the BMA had secured significantly higher payments and had removed the threat of Friendly Society control.

Most general practitioners were far better off under the new arrangements than previously. The Friendly Societies retained their responsibilities for collecting contributions and paying benefits on behalf of their members. As a result of negotiations the total funding available for medical benefits was increased to nine shillings per head per year. Of this sum, seven shillings was to be paid to the doctors and one shilling and sixpence was to be allocated for the provision of medicines through chemist contractors. A further sixpence would be paid to the doctors unless the cost of medicines exceeded the sum allocated, in which case it would go to the chemists. This arrangement came to be known as 'the floating sixpence'.[12] Chemist contractors were to be paid by item of service, although their claims were frequently discounted due to lack of adequate funding. The result of these increased payments was to raise employee contributions from 4d. to 7d. for men and 6d. for women.

Towards a National Health Service

Pharmacists had secured the right to dispense and, at least for a significant proportion of the population, prescribing and dispensing had at last achieved a formal separation. The outbreak of World War I in 1914 suddenly turned attention to more pressing matters, but the Drug Tariff emerged and gradually local formularies and war formularies were superseded by the British National Formulary, elements of which remain with us today. The social upheaval of World War II and the landslide Socialist victory in the election of 1945 brought about more health and welfare reforms, influenced not least by the economist, administrator and Liberal MP William Beveridge. A major component was the National Health Service Act 1946.

Once again the British Medical Association found itself in conflict with government, but by the appointed day for the commencement of the National Health Service in July 1948 over 18,000 general practitioners had signed up to supply family practitioner services. For pharmacists, as Holloway has commented, the new NHS was "in most respects, simply the old National Health Insurance scheme writ large."[13] Pharmacists had at last, except in rural areas, achieved their place as the proper providers of primary health care dispensing services. Hospitals, both voluntary and Poor Law hospitals were incorporated into the National Health Service.

To end a long history of Poor Law legislation, the National Assistance Act 1948 finally included the phrase, "The existing poor law shall cease to have effect and shall be replaced by the provisions of Part II of this Act." One should perhaps reflect that pharmacy practice in Britain as we know it today has its organisational basis in the arrangements for medical benefit under the National Health Insurance Act of 1911. Without the decisive part played by two men, David Lloyd George and William Glyn-Jones, life for pharmacists in our country might have been very different.

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11. J.A.Hunt, I.F.Jones, "Sir William Glyn-Jones a Pharmaceutical Colossus", *Pharm. J.*, 1995, vol.255, p.886.
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Review.

Apotheker Exlibris aus Deutschland, Osterreich und der Schweiz by W-H.Hein & A.Borchardt.
Govi-Verlag, Eschborn, pp. 121, 105 illustrations, including 9 coloured, DM 48. ISBN 3-7741-0643-6

The use of book-plates to indicate ownership is a practice which has almost died out in Britain, but in the German-speaking lands was certainly flourishing in the post-war period.

The authors relate that the earliest book-plate known in this area of the Continent is one of 1553,

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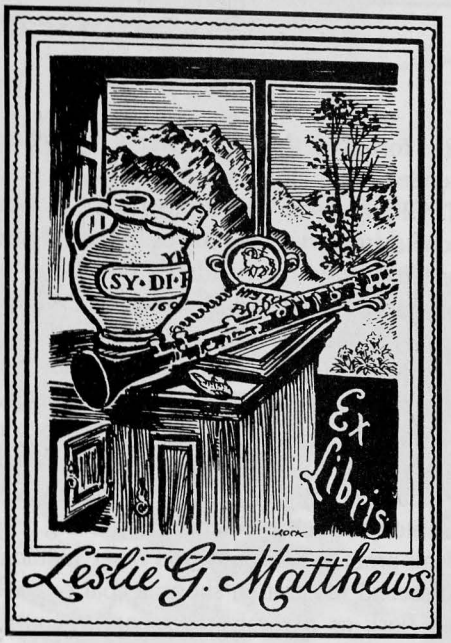
that of a Zurich apothecary called Hans Jakob Klauser which he "Latinised" to Joannes Jacobus Clauserus. He belonged to an important family of apothecaries who practised there for over 150 years. The arms of the Klauser family show a lion wielding a pestle in a mortar. The next oldest (1588) was of a Berlin court apothecary, Michael Aschenbrenner, who has three roses on his shield. Those of a number of many well known apothecaries, such as Basil Besler (1561-1629) of Nuremberg and Jakob Reinbold Spielmann (1722-1783), who had the Hirsch pharmacy in Strassbourg, are shown.

After the Introduction the book-plates are grouped together by subject, such as drawings of the exteriors and interiors of pharmacies, the tools of the dispensary and laboratory, and symbolism of the profession. There is also a section on the artists responsible for many of the book-plates, one or two as famous as Oskar Kokoschka. Perhaps most attractive of all is the fairy-tale house and pharmacy of Franz Xaven Munzel (1920) of Baden, Switzerland with its open, arcaded laboratory.

Rather surprisingly some apothecaries, for example Marco Birnholz of Vienna (1885-1965), Georg Bissantz of the Pelikan Pharmacy in Billigheim, near Bergzabern, and Hans Winkler of Lienz, Austria, each had numerous book-plates with many quite different designs.

One error was noticed, p.69 (Bild 50) in which Hans Winkler's Ex Libris is attributed to Georg Bissantz.

And just to prove that the practice is not dead in Britain those of Douglas Whittet and Leslie Matthews are shown..



WANTED

An "Ammoniaphone" similar to those illustrated in the accompanying advertisement. Please send price including postage and packing to:
W.A.Jackson, 13 Bournelea Av., Manchester M19 1AE.

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Apparatus of Bygone Days

by A.F.P.Morson

It is fortunate that T.Morson & Son's business interest in the manufacture of photographic chemicals extended to making a record of factory activity, the people, premises and equipment.

T.N.R. Morson had a laboratory at Southampton Row for his research on alkaloids, inorganics, creosote and other substances he introduced. When T.E.Wallis, curator of the Pharmaceutical Society's museum visited the Ponders End factory he recorded that he had seen on a shelf the apparatus which Morson had used, which makes the oldest items about 125 years old at that time.[1] The photograph (illus.1) taken in 1950 reveals small copper and brass items: stills of only quarter pint capacity, evaporating dishes, a covered reactor and a pan possibly used for coating pills. There is also a stoppered glass alembic of about three-quarters of a gallon. A ceramic cooling coil outlined against the window on the right alongside Morson's Society membership certficate may also be seen. Alas, the whereabouts of all these items is unknown.

Production equipment in the 19th. century was a larger version of that used on the laboratory bench, and presented difficult problems in selecting construction materials. An even greater problem was the making of leak-proof joints; putty and other mouldable materials which did not disintegrate with heat were used. The second illustration shows a coal or coke fired still with silica tubes encased in cooling jackets with a glass flask as a receiver discharging into a glazed ceramic jug. This was used for such products as hydrogen fluoride.

Larger scale but simpler equipment is shown in a photograph of 1915, (illus.3). An operator is attending the still with its cooling coil in a large steel drum discharging into a carboy, whilst the foreman studies his process instructions and the young apprentice has to stand on a box in order to wield his pestle. It is evident that by 1915 electric lights were installed. Chloroform manufacture was on an even larger scale. Here in illustration 4 can be seen tanks of up to a thousand gallons capacity and a still of probably 500 gallons, an indication of how important chloroform production was by 1902. The spare vapour head on the ground to the left had to be handled carefully as it was ceramic.

Rather more complex is the battery of creosote stills with receivers and pipework which enabled vacuum to be maintained whilst a receiver was emptied, (illus.5). By this date (1930) early chemical engineering was making changes to the plant, and equipment was benefitting from special steels.

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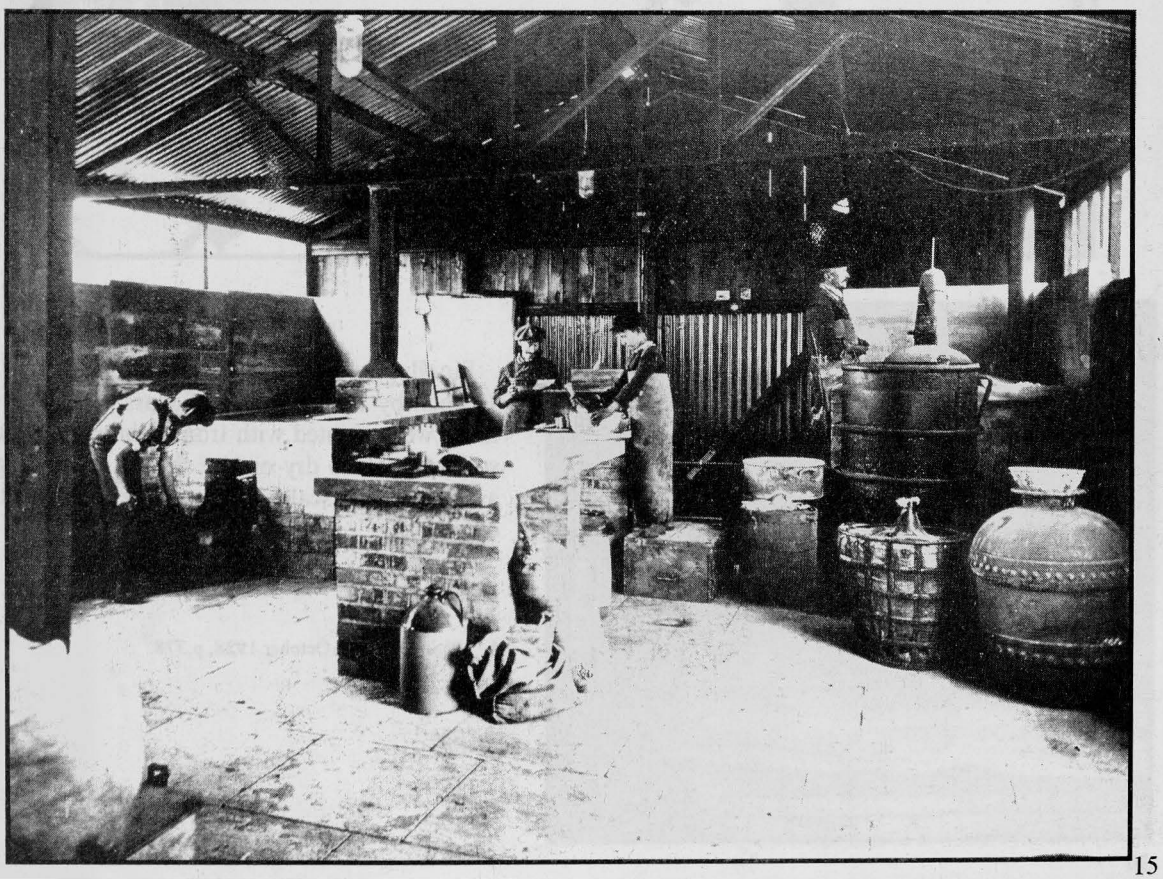

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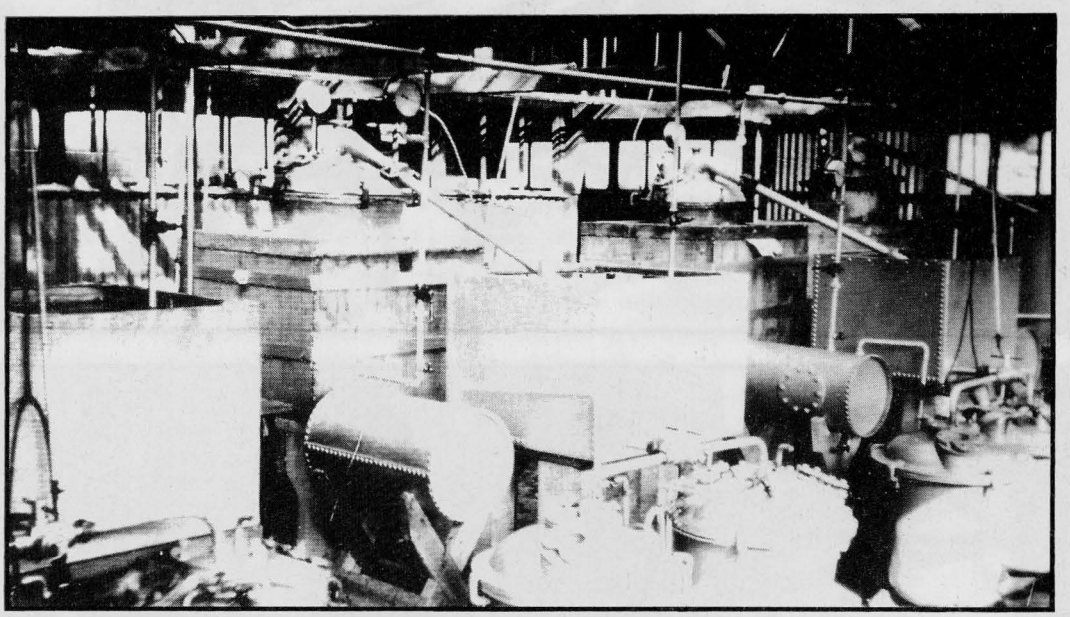

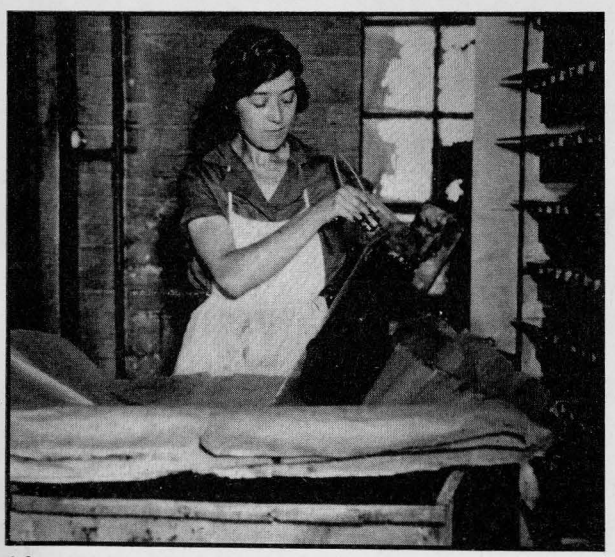

Finally, the simplest equipment of all was an 18 inch by 12 inch sheet of glass. Hundreds of these were painted with iron ammonium citrate solution, left to dry on the shelves on the right and later the scales were scraped off by the operative.

Reference

1. *Pharm. J,* 20th October 1928, p.378.

https://doi.org/10.24355/dbbs.084-201802161403

A LARGE ORDER

TO A HOMŒOPATHIC APOTHECARY.

Little Girl. "Please, sir, I want the hundred-thousandth part of a grain of magnesia."

Young Chemist (Whose hair would certainly stand on end, were it not so tightly pommaded down, at the simplicity of the little innocent in asking for as much medicine as would kill or cure a whole regiment of soldiers). "Very sorry, miss, but we don't sell anything in such large quantities; you had better apply at Apothecaries' Hall." And he follows her to the shop-door to see whether she had brought with her a hackney-coach or a van to carry away the commodity she had inquired for!

From *George Cruickshank's Omnibus,*
edited by L.Blanchard, 1842, London, Tilt & Bogue, p.64.

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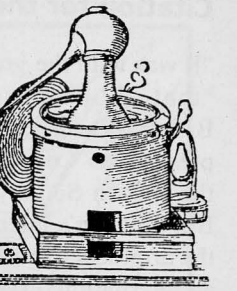
PHARMACEUTICAL HISTORIAN



Editor: Dr. J. Burnby, B.Pharm., Ph.D., FRPharmS., FSA.
36 York Place, Edinburgh. EH1 3HU

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Accreditation.

BSHP has now been registered as a provider of accredited courses with the College of Pharmacy Practice and has agreed to comply with the criteria laid down by the College. As a result accreditation of selected BSHP meetings has been given "which meet the requirements of the College will be accredited for the purpose of post-graduate education and a certificate of attendance issued."

Computer Appeal, a Success.

At our Annual Conference in Harrogate, an appeal was launched to raise funds to replace our editor's word processor with up-to-date equipment and new software. The initial target was £1,400. Thanks to the generosity of a number of pharmaceutical wholesalers and members, this target has been passed and we will now be able to purchase new equipment.
Major contributors who each gave £200 are:
D.Taylor, AAH Pharmaceuticals, Runcorn.
J.Briggs, East Anglian Pharmaceuticals Ltd., Norwich.
M.Guthrie, Graham Tatford & Co.Ltd., Portsmouth.
N.Bond, Philip Harris Medical Ltd.,Birmingham.
A.S.Young, L.Rowland & Co., Wrexham.
C.Etherington, Unichem plc.,Chessington.
Substantial contributions were also made by **S.J.C.Simms,** Sangers (Northern Ireland) Ltd., Belfast, and by **Gerald Brooks** of Sants Pharmaceutical Distributors, Newcastle-under-Lyme. We are also very grateful to members who contributed to the fund, both at our conference and subsequently.

The editor must point out that this great success is entirely due to the hard work of Dr Peter Worling, whilst she is still in a state of shock. Will readers please bear with her whilst she finds her way around?

The Leslie Matthews Memorial Lectures.

The lectures were held on 24 February 1998 the Wellcome Institute a year to the day that Leslie Matthews died aged 99 and 3 months;a joint meeting of the British Society for the History of Pharmacy, and the Friends of the Wellcome Institute. Letters of condolence and donations were received from France and the USA, and our BSHP member, Dr Annet Bierman, even travelled from the Netherlands.
Dr Burnby gave the introductory talk in which she spoke of the difficulties of Leslie's early life. Left fatherless at the age of two, his mother had to work as a housekeeper in order to keep the boy with her, which had been the dying wish of his father.
Classically, the village schoolmistress recognised the boy's lively intelligence and made it her business that he should have the opportunity of a secondary school education. Leaving school at fifteen he was apprenticed to a chemist & druggist in Norwich.
Called up into the army when 19, he had no desire, as he put it, "to carry a rifle", so failing to become a lorry driver he volunteered for the dangerous occupation of stretcher-bearer. To the end of his life, he remembered the tension of "going over the top" with the second wave of troops and waiting in no-man's land, the shell-pocked land-scape eerily lit up by the Very lights; and worst of all not knowing what was happening around you. He was awarded a Military Medal for bravery under fire. Then, almost inevitably, shortly before the war ended, he was severely wounded and it was feared for some time that he would lose his arm. However a sound constitution and good surgery, of which Leslie always spoke highly, prevented this.
On recovery he returned to pharmacy using a small army pension and a £100 from an aunt to study for and gain his Pharmaceutical Chemist qualification at 'The Square'.

The second lecture was given by W.A.Jackson which was entitled "The pipe smoking man: his forebears and descendants. English Drug Jars, 1650-1950." This subject was deliberately chosen because of Leslie Matthews' keen interest in the subject and choice collection, four of which he bequeathed to the Royal Pharmaceutical Society.

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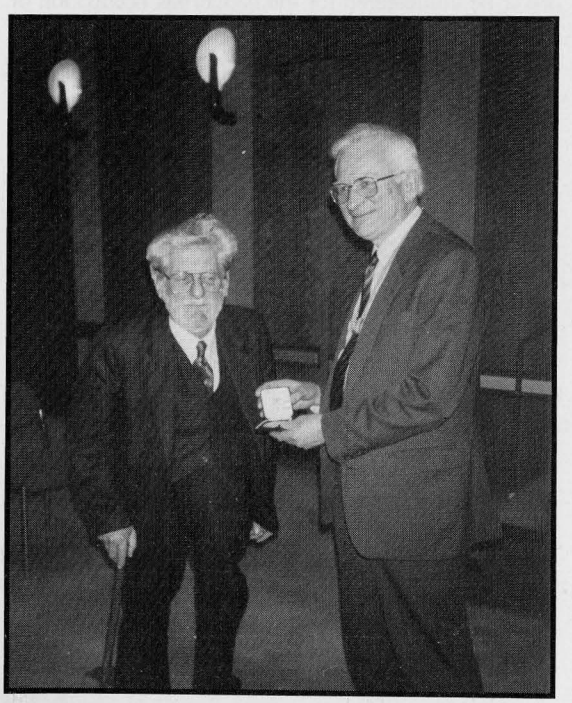
Citation for the Leslie Matthews Medal

"It was with the greatest pleasure" said Dr Burnby "that I proposed Mr William Jackson, B.Sc.(Pharm.), M.Sc.,FRPharmS, for the prestigious Leslie Matthews Medal awarded by the British Society for the History of Pharmacy. Bill Jackson's interests are mostly concerned with the artefacts of pharmacy for which he has gained an international reputation. Not only has he a fine collection of his own but he has been good enough to loan articles for exhibitions in both this country and abroad. He is currently Honorary Curator of the University of Manchester's Medical School, where he puts on several exhibitions every year; anybody who has been involved in exhibition work will know how much effort this entails. Not content with this he has written numerous, well illustrated articles of high standard which have been which have been published both here and in America.

Owing to contracting poliomyelitis as a child, Bill has had to contend with many physical problems, but he has never sunk back into invalidism which would have been only too easy; for this he has earned our greatest respect. On retiring from community pharmacy, he decided to enter for an M.Sc. by thesis at Manchester University in which he was successful in 1996. He has been a member of the International Academy for the History of Pharmacy for a number of years and an outstanding president of our own Society.



Members' Activities

Mervyn Madge has written to congratulate John Hunt on his comprehensive article, "From Poor Law to National Health Service". However being a man of Plymouth, a famous naval port, he wished to draw attention to the navy's first step in helping those in distress and seeking help. After the threat of Spain had been removed by the defeat of the Armada, there was a great cut in the number of seamen required. These men were thrown out to fend for themselves, so causing much distress and their were many calls for help. John Hawkins with help from Francis Drake inaugurated the Chatham Chest in order to relieve the situation. A step in the recognition of community responsibility to give help.

Dr Burnby has had a short note on bell-metal mortars published in the newsletter of the Historical Metallurgy Society.(No.38, Spring 1998) She has pointed out that an excellent article, "Comminution and English Bell-metal Mortars, c.1300-1850" by J.K.Crellin and D.A.Hutton appeared in *Medical History* (July 1973, pp.266-287 + 8 pages of illustrations); other important ones are "Some English Bell Founders and their Mortars" by Agnes Lothian in the *Chemist and Druggist* ((28 June 1958,pp.705-711) and "York Bell-founders and their Mortars" by D.A.Hutton in the *Pharmaceutical Historian* (Vol.14,No.3, pp..2-5)

In return the newsletter editor wrote that an article "Neale Mortars" by Dr Roger Brownsword had appeared in the *Journal of the Antique Metalware Society*, Vol..3, June 1995.

HEALTH AND MEDICINE ON STAMPS.
Tom Wilson

ISBN 0 9532259 0 9, 1998, A4, 117 pp. indexed, comb-binding with numerous b. & w. illustrations. £10, US $16 plus £2 p. & p.

The author of "Tug's War", and "Diary of a Rambler" has assembled 25 articles re-printed from philatelic magazines during the past ten years. The articles are interesting for their own sake, as well as providing an informative insight into the many aspects of collecting 'medicine' on stamps. They include pieces on malaria, smallpox, leprosy, heart disease, nursing, pharmacy and celebrities in medicine. The illustrations are taken from Tom Wilson's own collection.

For a copy send remittance of £12 or US $ 20 to: Tom Wilson, 162 Canterbury Rd., Ashford, Kent. TN24 9QD, England.

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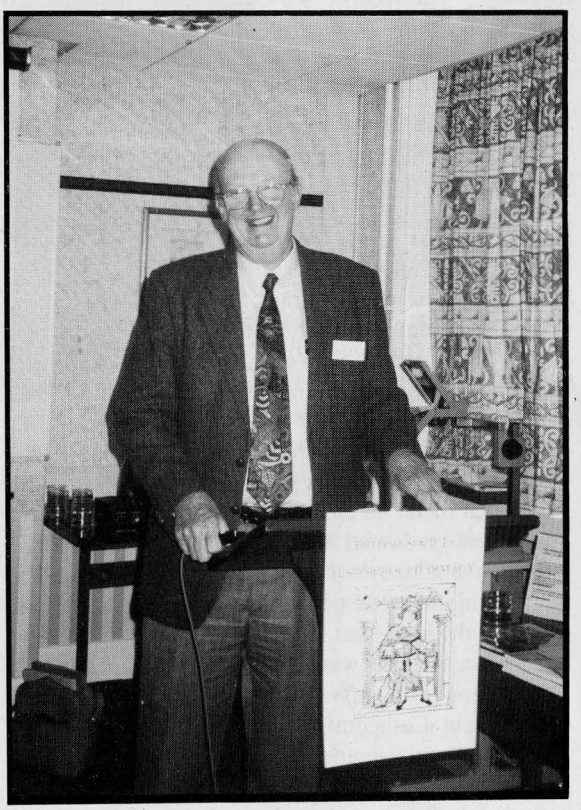
The Knaresborough old pharmacy unusually seen from the rear

The Harrogate Conference

Perhaps the most interesting event of the whole conference was the conducted tour by Dr Arnold Kellett of the old pharmacy in Knaresborough.A Grade 2 listed building, and known to have been founded at least as early as the reign of George I, it still retains its beamed interior, a massive pestle and mortar, bleeding couch and drug run, tragically however it is no longer a pharmacy, but is up for sale to any purchaser.

For safety's sake many artefacts, such as pill machines and drug jars, have been removed to Beech House where BSHP members met Mr Stuart Newsome, the managing director of J.Pickles & Sons who own the pharmacy. Both men would dearly love to see the building in operation again as a pharmacy but realistically speaking this is not an option any longer. The best that can be hoped for is that it could be turned into a working museum from which could be sold some of the pharmacy's old proprietaries, such as its famous lavender water. The Conference members realised that Mr Newsome was more than willing to be accomodating. Surely, this is something which must be done for the sake of history of pharmacy if it is to have any credibility in this country? Or are we going to see yet one more 'Ye Olde Tudor Tea Shoppe'.?



Geoff Miller from Western Australia telling the Conference about the history of pharmacy in Australia

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Erasmus Darwin, (1731-1802): a great eighteenth century English physician

Dr G.C.Cook

Erasmus Darwin was born at Elston, Nottinghamshire, on 12 December 1731; his father was Robert Darwin (1682-1791) and his mother Elizabeth (1702-1797). Later in life he was grossly overweight, even by contemporary standards, was heavily pock-marked, spoke with a stammer, was extremely clumsy and walked with a limp due to the fracture of a patella resulting from a carriage injury. These are not characteristics one would immediately associate with the greatest physician of the era. However, that is exactly what he became; arguably, his greatest accolade was to be repeatedly asked by George III to be personal physician. Darwin declined, because he was not keen on moving from the Midlands to London.

Unfortunately, most individuals know little more about Darwin than that he was the grandfather of Charles Robert Darwin who published the *Origin of Species by Natural Selection* in 1859. Both Erasmus' younger sons by his first marriage, Robert and Charles, married Wedgewoods.

Darwin lived and practised long before the 'germ theory' of diseases was understood; during his lifetime, however, James Lind (1716-1794) delineated the aetiology of scurvy. Darwin, however, was able to keep abreast of contemporary medical opinion; his microscope is preserved at Derby.

He attended Chesterfield School and subsequently entered St. John's College, Cambridge. Following graduation there, he moved to the Edinburgh Medical School and graduated in 1755. The following year he set up in practice in Nottingham, but owing to the fact that he received only a single patient, he moved to Lichfield later that year. He was attracted there largely because he was in possession of a letter of introduction to Canon Seward, Canon Residentiary of Lichfield Cathedral, whoe daughter, Anna, was subsequently to become Darwin's 'Boswell'. Lichfield is of course well known, not only for its great cathedral, but also as the birthplace of Samuel Johnson and David Garrick, both known to Darwin, although according to Anna Seward he had nothing in common with the former.

Following his marriage to Mary Howard (1740-1770), he moved into a house situated in the Cathedral Close, now undergoing renovation with the objective of creating a national memorial, including a museum, to house Darwin memorabilia with an educational centre. Having borne him five children, Mary died at the age of thirty,probably from gall bladder disease complicated by liver involvement resulting from over-indulgence in alcohol. Following her death, Darwin had a lengthy liaison with Mary Parker who bore him two illegitimate daughters.

At around this time, Anna Seward was anxious that Darwin should marry her, however this was not the case, and he married instead Elizabeth Chandos-Pole (1747-1832). Subsequently she bore him seven children (making a total of fourteen). One of Elizabeth's conditions of marriage was that they should move away from Lichfield. The reason for this is not entirely clear but it is probable that her antagonism to Anna Seward was relevant.

They moved initially to Radbourne Hall, about four miles from Derby, but it proved impossible for Darwin to carry out his medical practice from there. They therefore moved to central Derby in 1784 where they remained for approximately eighteen years until finally moving to Breadsall Priory in 1802.

Darwin became very interested in female education. probably because his two illegitimate daughters became school teachers. He bought them a house in Ashbourne which was used as a school.

Darwin was not, however, solely a physician. He had many other interests, including botany, poetry, writing and inventing. He was also an important early evolutionist, whose ideas pre-dated those of his grandson, Charles, by many decades. Darwin also founded the Lunar group which later became the Lunar Society of Birmingham. He founded a botanic garden about a mile from Lichfield, and Brooke Boothby became one of the few members of the Lichfield Botanical Society. This venture gave rise to his first major literary, *The Botanic Garden* (1789-1791). Later literary works included: *Zoonomia: or the laws of organic life*, (1794-1796), volume four containing an account of evolution, *A Plan for the conduct of female education in boarding schools,*(1797), *Phytologia: or the philosophy of agriculture and*

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gardening,(1800) and *The temple of nature* which was published posthumously in 1803. As a poet, Darwin was in his time pre-eminent; he precedeted the great Romantic poets, Coleridge, Wordsworth, Keats and Shelley, all of whom were influenced by his works. Darwin was also opposed to slavery, and with other members of the Lunar Society, made his views clear long before William Wilberforce established his anti-slavery society.

The Lunar Society included many distinguished individuals of the day. They met at each other's houses when the moon was full to enable them to travel home by the light of the moon. Permanent members of the society included Matthew Boulton, Josiah Wedgwood and William Withering best known for his treatise, *An Account of the foxglove, and some of its medical uses....*(published 1785). Darwin became involved in a controversy with Withering based on the priorities in the use of *Digitalis purpurea*; this regrettably did nothing to enhance Darwin's reputation. Other members of the society were James Watt, Joseph Priestley and John Whitehurst. Well known to the society was Benjamin Franklin. The Lunar Society was supportive of the American War of Independence and the French Revolution -at least initially, and was influential in the industrial revolution in Britain. Darwin was elected a Fellow of the Royal Society in 1761.

Soon after removal to Breadsall Priory, Darwin died fairly suddenly. Although he had suffered from severe febrile episodes prior to this, the widely held view that death was a result of an acute myocardial infarction cannot be upheld in the light of recent findings. A memorial to Erasmus Darwin is to be found in the south aisle of Lichfield Cathedral. This building also contains plaques and memorials to Lady Mary Wortly of variolation fame, the Seward family and Charles Howard, Erasmus' brother-in-law. King-Hele has recently recently high-lighted new findings about Darwin which have come to light from recently deposited archives in Cambridge University Library.

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Review.

Operative Chymist by Anthony Morson.

Rodopi, Amsterdam and Atlanta, 1997, pp.294. index., 6 appendices, 19 b.& w. illus., ISBN 90-420-0366-9

Price, paper back, £14 or US$ 23.50.

One must say quite boldly, that this is a very important book for Britiah history of pharmacy. Too little has been written on this subject, so allowing other disciplines and other countries to assume that there was no history, and almost no true pharmacy into the bargain.

The author has obviously read widely about the scientific period in which his forebear, Thomas Newborn Robert Morson, lived. His scientific and social world and the one in which he rose to prominence, his family background, and above all the outstanding work which he did in early alkaloidal manufacture are all closely examined. The writer has also shown us, or rather reminded us, what an important part T.N.R. (by which he came to be familiarly known) played in the early years of the Pharmaceutical Society, particularly at the time of Jacob Bell's death. The rise of the middle classes in the nineteenth century, the importance that they eventually attained, especially in certain fields of applied science, and their failure in others, are all considered.

He knocks Theophilus Redwood off his not entirely justified perch, although one is left with a suspicion that T.N.R. should have been firmer and was perhaps too considerate of close family connections.

The book is delightfully free from typographical errors, in fact only two were found. A work of such depth and breadth must of course have a few mistakes which should be dutifully mentioned. William Martindale's dates are 1840-1902 (not 1809 - 1902), and it was his son, William Harrison Martindale, who recalled in the *Pharmaceutical Journal* of 1927 (p.616) the days when he and his father worked with Lister in 1886.

In short this is an excellent book and no person who has an interest in pharmaceutical history should fail to read it, then inwardly digest and cogitate.

J.Burnby.

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WHO *WAS* 'LILY THE PINK' ?
The story of an American proprietary medicine.

W. A. Jackson

Introduction.

This is an account of a Massachusetts woman who originally made a herbal compound in the cellar of her home. It became an extremely successful proprietary medicine, celebrated in song in the United Kingdom as well as America. It also describes the initial problems of the family company which marketed it, its rise to fame, subsequent decline and its eventual sale. Finally, it tells of the survival of the reformulated medicine to the present day.

The Song.

Refrain - We'll drink a drink, a drink, to Lily the
Pink, the Pink, the Pink,
The saviour of the Human Race,
For she invented 'Medicinal Compound',
Most efficacious in every case.

In 1968 Parlophone issued a humorous recording entitled "Lily The Pink", a traditional tune arranged and sung by three young Liverpool men who called themselves 'The Scaffold'.[1] This enjoyed a considerable success for a number of years, but I suspect that few people realised that the eponymous heroine of the song had been a living person who had manufactured and sold a popular American proprietary medicine. In an article published in 1974 Dr John Paton gives the refrain of a drinking song popular with rugby clubs and medical students as:[2]

"For we'll drink, we'll drink, we'll drink to
Lydia Pink - a - Pink -a -Pink,...."

Dr. J.R. Gwilt however states that the "first verse of the definitive version of the industry song was:

"Sing, oh sing, oh sing to Lydia Pinkham,
Pinkham, Pinkham, Lydia -...."[3]

However, in her book *Female Complaints* Sarah Stage says that the original ballad sung by American college men was;[4]

"Oh-h-h, we'll sing of Lydia Pinkham
And her love for the Human Race...."

Lydia Pinkham.

Lydia, the tenth child of William and Rebecca Estes, was born in Lynn, Massachusetts on 9 February 1819. Her father, originally a shoemaker, established a saltworks near his home which proved to be a good investment. He used the income from it to become a gentleman farmer and later made a fortune in real estate. Lydia joined the Lynn Female Anti-Slavery Society when she was sixteen. She became a schoolteacher after graduating from Lynn Academy, and in 1843 was elected secretary of the Freeman's Institute, the constitution of which stated that "No person shall be excluded from full participation in any of the operations of the Society on account of sex, complexion, or religious or political opinions." The emphasis on sexual equality then was even more controversial than that of race, and Lydia, who was five feet ten inches tall, believed strongly in the rights of women. It was at the Institute that she met Isaac Pinkham, a 29 year old widower, and after a brief courtship, they were married in September 1843.

Isaac was a pleasant and friendly fellow, but not over-endowed with intelligence, and lacked the forceful personality necessary in an entrepreneur. He was a shoe manufacturer but soon became dissatisfied with the returns. The birth of a son, Charles Hacker Pinkham, in 1844 only increased his desire to get rich. In 1845 he abandoned the shoe business in favour of a succession of speculative enterprises. The *Lynn Directory* shows him listed as a produce dealer, kerosene manufacturer, trader, labourer, farmer and builder. A second baby died from gastroenteritis in 1847, a year after he was born; a third, Daniel, was born a year later. Lydia's father died in 1848 and Isaac had high hopes of making his fortune by using her share of the estate.

However, although William Estes left a considerable amount, it had to be divided between his widow and ten surviving children. To supplement the legacy Isaac began to borrow money to finance his enterprises. He was continuously buying and selling and in 1857 the family moved to Bedford, Massachusetts. Another son, William, had been born in 1852 and a daughter, Aroline Chase Pinkham, arrived shortly after the move. By this time the family's finances were in an unhealthy state, and there seemed little chance of improvement.

Charles left high school to help support the family but enlisted in the army shortly after the start of the Civil War. Dan and Will stayed at school but helped by selling popcorn and fruit in their spare time. After leaving high school Dan travelled to Missouri, Kansas and Texas, working as a cattle drover and later as a teacher. However, his health was permanently damaged by a fever, so returned to Lynn in 1872 and opened a grocery store. Will became a teacher at Clinton Grove High School, and by 1872 the family were more secure financially than they had been at any time since the marriage. But Isaac, with money at his disposal, indulged his love of speculation in real estate, and signed promissory notes for his acquaintances to raise loans.

During this period of affluence he had guaranteed a loan for George Clarkson Todd, and when Todd defaulted, Isaac had to pay twenty five dollars on the promissory note. In return, Todd gave him as partial payment, the recipe for a medicine to cure 'female complaints'. At this time many Americans were disenchanted with the heroic medicine practised by orthodox doctors who regularly employed vomiting,

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Portrait of Lydia Pinkham, c. 1875
The Schlesinger Library, Radcliffe College.

blistering, bloodletting and massive doses of mercury, and there was a great interest in homoeopathic and herbal remedies. As one might expect in a country in which many families' forbears had been self-reliant pioneers, most housewives made many of their own medicines and Lydia was no exception. She kept a manuscript book labelled 'Medical Directions for Ailments' which contained remedies for various complaints.[5] Many were simple herbal mixtures but others sound very strange to us to-day, for example:

> "A hog's milt (spleen) procured fresh from the slaughter house split in halves, one half to be bound on the sole of each foot and allowed to remaint there until perfectly dry, will produce relief and in many cases effect a cure of the complaint called asthma."

Her main reference book was John King's *American Dispensatory* which listed the therapeutic properties of many herbs. It is uncertain whether her medicine was made to Todd's original formula or whether she used her knowledge of herbs to amend it. Certainly it was sufficiently popular for her to keep several bottles in stock so that she could give some to her neighbours when occasion arose.

The Medicine

The original formula, written by Lydia in a clear, easily legible hand with detailed instructions for its preparation, occupies five pages of the 'Album of Lydia Pinkham' which is stored in the Harvard Depository, Massachusetts.[6,7] It consisted of:

8 oz Unicorn root
6 oz Life root
6 oz Black Cohosh
6 oz Pleurisy root
12 oz Fenugreek seed

This was sufficient to make one hundred pints.

King's *American Dispensatory* stated that Unicorn root was useful in preventing miscarriage, in cases of amenorrhoea, dysmenorrhoea, chlorosis, and inflammation and prolapse of the uterus, and that it should be used with Life root and Pleurisy root for uterine diseases. Life root was also known as 'Squaw-weed' or the 'Female Regulator', and was recommended as a substitute for Ergot as an abortifacient. Black Cohosh was said to be useful in treating amenorrhoea, dysmenorrhoea, and leucorrhoea, and also for the relief of pain after childbirth. King observed that several cases of uterine prolapse had been cured by using Pleurisy root and Unicorn root; Fenugreek was thought to be a mild aphrodisiac.[8]

Neither King nor Lydia Pinkham seem to have worried about the paradoxical combination of Unicorn root (said to prevent miscarriage) and Life root (an abortifacient). More recently, the 1994 edition of *Potter's New Cyclopaedia of Botanical Drugs and Preparations* observes that Unicorn Root has oestrogenic properties, though the active constituents have not yet been identified, and confirms that Life Root and Black Cohosh are emmenagogues. Pleurisy Root has been demonstrated to have oestrogenic properties in rats, and alcoholic and aqueous extracts of Fenugreek have been reported to be oxytocic in animals.[9]

The Company.

In 1873 the failure of Jay Cooke, a New York banking house, caused a panic which resulted in the greatest financial crisis that had until then occurred in America. All Isaac's holdings were heavily mortgaged and when the Lynn banks foreclosed, he was lucky to avoid arrest and imprisonment. A broken man, he never recovered and died in 1889. Daniel had allowed his customers too much credit and he lost his grocery store. By 1875 the family were struggling to survive. William, Charles and Aroline were all working and helped with the finances, but things were still difficult. It was at this time that Daniel thought of selling his mother's cure for female ailments. The family business, 'The Lydia E. Pinkham Medicine Company' which was to make Lydia's name known throughout America, was founded in 1876.

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Botanical remedies were so popular, it was decided to market the medicine under the name of 'Lydia E. Pinkham's Vegetable Compound'. Although Lydia and her children were members of a local temperance society, they regarded the alcohol which the remedy contained as a therapeutic agent as well as a preservative, and so saw nothing wrong in selling a medicine which had a higher alcohol content than sherry. In answer to their critics, they claimed that the recommended dose of three spoonfuls daily did not constitute a threat to temperance.

The Advertisements

Initially Lydia made the medicine in the cellar of their house, as well as answering correspondence and writing advertising copy. Her first four page *Guide for Women* was distributed by Dan and Will in the neighbouring towns, and later in Boston where the wholesalers, Weeks and Potter, ordered a gross of the medicine on approval. In these early days, sales averaged only one bottle a day. Dan then moved to Brooklyn, but there many women refused to read the pamphlet owing to its frank language which included a reference to 'Prolapsed Uterus' on the cover. His next stratagem was to leave small visiting cards in public places. These had a hand-written message on the back, purporting to come from 'Cousin Mary' advising the purchase of the Vegetable Compound for uterine complaints, and giving the name and address of a pharmacy which stocked it. This had only a limited success. He then persuaded a dressmaker to offer sample bottles of the medicine to her customers and acquaintances, but this scheme backfired when it made one woman worse than she had been previously. His next idea to increase the number of customers was to advertise the medicine for kidney complaints, a common problem and one from which men suffered as well as women. So, 'Weak and Diseased Kidneys' were added to the conditions indicated.

Then, Will took a step which the family considered foolhardy. He had the whole text of Lydia's four page pamphlet printed on the front page of the *Boston Herald* at a cost of sixty dollars. However, the *Herald* had a circulation of 50,000, and it would have cost almost a hundred dollars to print this number of leaflets. It enhanced the reputation of the firm and within two days they received orders from another three wholesalers. The Pinkhams now made extensive use of newspaper advertisements, even mortgaging the family home to pay for them.

The next big advance was that Dan persuaded Charles N. Crittenton, a leading New York patent medicine dealer who at one time kept 12,000 proprietary articles in stock, to take the Vegetable Compound.[10] Not only did Crittenton pay cash instead of taking the medicine on approval, so helping the business to survive, but this encouraged other wholesalers to purchase stocks themselves. By the end of the century the company's advertising budget was approximately $1,000,000 annually.[11]

The famous face.

In 1879 Dan had the idea of using a portrait of 'a healthy woman' to advertise the medicine. It was decided to use one of Lydia herself.[12] The result was an immediate success. Her still attractive face with its serene expression inspired confidence; within a few months of its first appearance an offer of $100,000 for the company and its new trademark had been received and rejected. It was a wise decision.

By 1881 annual sales of the medicine reached almost $200, 000. Soon Lydia's face was known throughout the United States. If newspaper editors required a picture of a well known woman which they did not possess, for example Queen Victoria or Lily Langtry, many of them would use that of Lydia Pinkham as they invariably had an electrotype of her to hand. It also appeared on the bottle labels of Vegetable Compound and on showcards advertising it. In fact, her face became so familiar that the men of Dartmouth College in New Hampshire wrote a parody to the tune of "Our Redeemer"

"There's a face that haunts me ever,
There are eyes mine always meet;
As I read the morning paper,
As I walk the crowded street..

Other college glee clubs adopted the song, and it is said that many ribald verses were added as time progressed. Those sung by 'The Scaffold', though innocuous, give some indication of the ridicule to which the medicine was subjected - for example;

"Brother Tony was known to be bony.
He would never eat his meals.
And so they gave him Medicinal Compound.
Now they move him round on wheels."

By 1941 it was estimated that $40,000,000 had been spent on printing likenesses of Lydia's face.

The correspondence.

Another factor in the company's success was that from 1879 the leaflets and advertisements invited potential customers to write to Mrs Pinkham about their complaints. Towards the end of the century there was an increasing tendency to obtain sales at the expense of the medical profession by appealing to Victorian modesty, and the advertisements promised "Men **never** See Your Letters". (Unfortunately, most of these letters were destroyed before the firm's archives were sent to Radcliffe College.[13]) This was only one of the assurances guaranteed to safeguard the writers' modesty, and resulted in one reader commenting:

"The cuts (i.e. the illustrations) in the Pinkham booklet present to us an Adamless Eden. The very office boy is a girl. The bird in the weather vane is unmistakably a hen.... It is unfortunately necessary to hire a few men in the bottling room, but they have all outgrown the riotous

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passions of youth, and I am told that they are forbidden, on pain of death, to read the labels. I do not believe the story that, in her eagerness to respect the modesty of her afflicted sex, Mrs Pinkham will not ship goods on trains that carry the mails."[14]

As with many nineteenth century medicines, testimonials from satisfied customers were used extensively for advertising. The writers were not paid a fee but each received at Christmas a silver spoon embossed with Lydia's face. Sometimes a free supply of of the Vegetable Compound for the writer's use was offered in return. Lydia continued to answer correspondence until 1883, the last year of her life.

After her death, the advertisements still urged women to write to Mrs Pinkham for advice and a correspondence department was established to deal with it To obviate possible criticism in the future, Charles' wife Jennie Pinkham, became the nominal head, although she did not really oversee the work of the thirty typists employed. Advertisements were designed which implied that Lydia was still alive with Jennie acting as her assistant.

The Competition

One problem which arose was that fake bottles of the 'Vegetable Compound' were being manufactured and sold by a man named Howells, who was also counterfeiting 'Peruna' and 'Paine's Celery Compound, two other popular proprietary medicines. Samuel B. Hartman who owned 'Peruna', and Charles Pinkham jointly employed the Pinkerton Agency to investigate, with the result that after a three months search the counterfeiters were arrested, received an eighteen month jail sentence and a $350 fine. Unfortunately, the Pinkham's share of the bill was more than $7,000.

More serious was the competition from 'Dr Pierce's Favorite (sic) Prescription'. Dr Ray Vaughn Pierce MD was a founder and president of the 'World's Dispensary Medical Association'. He had resigned from Congress in 1880 to devote more time to this organisation which owned an Invalid's Hotel in Buffalo, New York. This was destroyed by fire in 1881 and promptly rebuilt, with the addition two years later of an annex for the manufacture of medicines which doubled the size of the original building. The infirmary was described as "**A Model Sanitarium (sic) and Surgical Institute**" whose staff included eighteen physicians and surgeons. Later a branch of the Association was opened in New Oxford Street, London, England.

Pierce published a book of more than a thousand pages, *The People's Medical Adviser,* a popular guide to anatomy, physiology, hygiene, phrenology, marriage and pregnancy, herbal remedies, the treatment of various diseases and deformities, and mechanical aids.[15] He also manufactured and sold a number of proprietary medicines including his 'Golden Medical Discovery', 'Pleasant Purgative Pellets' and Compound Extract of Smartweed' as well as the 'Favorite Prescription' recommended for regulating menstruation and as a nerve tonic for diseases involving the female reproductive organs. All these featured in his book which contained about 650 testimonials, often accompanied by photographs of the patient praising either the treatment received in the 'Invalid's Hotel' or the efficacy of Dr Pierce's medicines. Other methods of advertising such as billboards were also used.

I have been unable to find any figures for the sales of Dr Pierce's medicines, but as Pinkham's Vegetable Compound has survived to this day and I can find no independent reference to the sale of Pierce's in this country, in spite of being sold from a branch of the 'World's Dispensary' in London, it would appear that the Pinkham company was more successful in this field.[16] Much of Pierce's revenue must have come from the 'Invalid's Hotel' and the sale of other pharmaceutical products.

Family Disputes

Family disputes became a problem in the early twentieth century. Dan and Will had both died in 1881, and Charles had accepted the responsibility of running the business at a salary of $5,000 per annum. Aroline had married Will Gove in 1882, and they lived in Salem where he had a law practice. Aroline had given her husband half her shares in the company, and they each drew a salary of $1,000 a year for purely nominal duties. Charles felt he was underpaid, but Aroline thought his salary adequate and that the profits from his shares in the company should provide the bulk of his income. This created a great deal of ill feeling between the two sides. When Charles died in 1900 from kidney disease leaving his widow Jennie with six children, the Goves who owned 50% of the company shares seized control. Aroline, a formidable woman, is reported to have said to Jennie's eldest son, Arthur, aged 21, "For years your father ran this business and I suppose you think you are to run it now. Mr. Gove is the new President and General Manager and will remain so for a good many years to come. You, Arthur, will never have anything to do with this business; neither will your mother."[17]

As both parties held the same number of shares, a stockholders' meeting could not have helped the Pinkhams, but Arthur took decisive action. He insisted that all letters addressed to "Mrs. Pinkham" be delivered to his mother, not to the factory, and then set up a rival company.

He started to manufacture a medicine to exactly the same formula as the 'Vegetable Compound' but

Bibl. d. TU Braunschweig

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gave it the name 'Delmac Liver Regulator'. On its label was a picture of the late Charles Pinkham, known throughout the country by druggists as the manufacturer of 'Pinkham's Vegetable Compound'. Jennie wrote a glowing report of the medicine's virtues and signed it 'Mrs. Pinkham'. Arthur then took a bottle to Will Gove and asked him to taste it. Will was dismayed to find its taste to be identical with that of the 'Vegetable Compound'. After some negotiations Jennie agreed not to market any competitive products in return for a seat on the Board of Directors and appointment as Manager of the Correspondence Department at a salary of $5,000 per annum. Arthur became Vice-President and Secretary.

Unfortunately, Gove was a poor administrator and sales dropped, declining by 68% between 1903 and 1908. An important factor in this decline was the campaign currently being directed against patent medicines. As part of this, in 1905 *The Ladies Home Journal* reprinted a Pinkham advertisement, published on 27 June of that year, advising women to write to Mrs Pinkham for advice, and alongside it, a photograph of Lydia's tombstone in Pine Grove Cemetery showing that she had died on 17 May 1883, 22 years previously. The company protested that it had issued several advertisements which showed that the Mrs Pinkham who answered the letters was Lydia's daughter-in-law. Many nevertheless, felt that they had been deceived and sales suffered seriously. Shortly afterwards it was shown that the letters were in fact answered by typists who copied standard ones, and this further harmed the company's reputation.

Another part of the campaign was directed at discrediting testimonial advertisements, by showing there were 'testimonial brokers' who collected and sold these to many different firms.

Towards the end of the nineteenth century proprietary medicines were heavily advertised in both medical journals and newspapers, and many doctors prescribed them in spite of the fact that they did not know what they contained. A survey of New York drug stores showed that nostrums and tablets, reckoned as a percentage of physicians' prescriptions dispensed had risen from less than 1% in 1874 to 20-25% by 1902.[18]

Legal Problems

There were also problems with the law. In 1900 eight men who were distributing Pinkham leaflets which contained references to prolapsed uterus, menstrual disorders and leucorrhea were arrested and jailed for distributing 'obscene literature'. It was claimed the plain language was necessary to enable many women to understand their illness, and that the medicine was not advertised or intended to be used as a contraceptive. Also a tactful behind the scenes reminder of the thousands of dollars spent on

An early Vegetable Compound bottle label
The Schlesinger Library, Radcliffe College

advertisements in the local press, resulted in the mayor dropping the case. However, within a month another arrest in Wilkes-Barre suggested there was an organised campaign against the company in Pennsylvania, so it was decided to discontinue the distribution of leaflets there.

The Proprietary Medicine Manufacturers and Dealers Association with Charles Crittenton as its leader was formed in 1881 to protect their interests. Initially its efforts had been successful, but the number of bills introduced in different legislatures requiring vendors of patent medicines to print the constituents on the label grew year by year. A sustained campaign against fraudulent or exaggerated claims for proprietary medicines led the Association in 1905 to call for an end to nostrums which contained narcotics or an excessive amount of alcohol. On 30 June 1906 the Pure Food and Drugs Act was signed by Theodore Roosevelt. This required that medicine labels should state the amount of alcohol and of a number of dangerous drugs, including opiates, chloral hydrate and acetanilide if present. If the owner of a proprietary medicine guaranteed that it met the required legal standards, Professor Wiley, the chief chemist of the Department of Agriculture gave a guaranty serial number, but pointed out that this did not mean the Government guaranteed the product. However, the ambiguity of the word 'guaranty' allowed manufacturers to use the law to help their sales by labelling their medicines with the official guaranty number and the phrase, "Guaranteed Under the Pure Food and Drugs Act".

The more outrageous claims on Pinkham's labels were reduced: "A Sure Cure for Prolapse Uteri" became "For Prolapse Uteri", and "... other female weakness" replaced "... all female weaknesses", and the claim to cure "... all weaknesses of the generative organs of either sex" was eliminated. The new law did not control

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pamphlets and Pinkhams used these to claim the medicine was more effective and cheaper than orthodox medical treatment. Sales gradually rose again.

The fight against the 'nostrum evil' was revived by Arthur J.Cramp of the American Medical Association's Department of Propaganda, and the 'Vegetable Compound' was one of his targets. It had been analysed for the British Medical Association and found to contain 19.3% alcohol but only 0.6% of solids.[19] Cramp used these figures to suggest that it be classed as a 'medicated liquor' as it did not contain sufficient medication to prevent it being used as a beverage. The company re-formulated the medicine, increasing the proportion of the original ingredients and adding Dandelion, Chamomile, Liquorice root and Gentian. This new formula was approved by the Treasury Department but was not entirely satisfactory. The additional drugs resulted
in a sediment and fermentation occurred which caused some bottles to explode. Sales were again reduced.

Replacing the wooden storage vats by glass-lined tanks, sterilising the bottles and pasteurising the medicine solved these problems. Later, the alcohol content was reduced to 15% and claims to treat prolapse and leucorrhoea were abandoned. Sales increased once more and profits reached more than half a million dollars per annum by the middle of the 1920s.

Will Gove had died of cancer in 1920, and after some dispute, in 1921 a new board of directors was formed - three Pinkhams and three Goves. The Pinkhams were to manage the manufacturing and the Goves the financial side of the business. The advertising department was run by Will's son Bill. He died in 1925, and his sister Lydia took his place. By this time relations between the two families were again under stress. Lydia in spite of all protests, radically changed the type of advertising with disastrous results. Sales dropped again. The Goves had a great deal of money and Lydia was now so determined to drive out the Pinkhams that she was prepared to ruin the company in order to buy them out. Eventually the Pinkhams refused to supply her with more money and in 1935 all advertising ceased for six months. The families fought each other in the courts until, in 1937 an injunction was granted which forbade the Goves to interfere in the business.

Trade increased in the 1940s but started to fall again in the '50s, and in 1968 the company was sold to Cooper Laboratories. They promptly stopped all advertising, and moved the manufacturing plant to Puerto Rico to reduce costs, while maintaining sales of more than $700,000 dollars a year.

It is possible that this sale stimulated a renewed interest in the product in Britain and this resulted in the 'Scaffold's' recording of 'Lily the Pink'. Certainly the media seem to have been attracted, for in February 1969, Walter E. Sneader observed:

"Extravagant claims concerning the efficacy of Mrs Lydia E Pinkham's Vegetable Compound have recently been advanced by the mass media. While not disputing Mrs Pinkham's sincere desire to terminate her friends' suffering, the importation of this preparation from the U.S.A. seems to me quite unjustified in the absence of the results of clinical trials. It is to be hoped that pharmacists will not accede to any renewed public demand for this product which had rightly fallen into disuse."[20]

Rather surprisingly, a modified version of the medicine, now known as 'Lydia Pinkham Herbal Compound' is still on sale. The label still carries a picture of Lydia E. Pinkham, though I think that anybody who knew the lady would have difficulty in identifying it as her likeness. It now contains Jamaica Dogwood, Pleurisy Root, Liquorice, Dandelion, Gentian, Motherwort, Ferrous Lactate, Vitamin C and Vitamin E and has an alcoholic content of 10% (claimed to be used solely as a solvent and preservative).[21] The only therapeutic claim made is that it "Helps you feel better during those special days." There is no indication of the manufacturer, but it is now distributed by Numark Laboratories Incorporated of Edison, New Jersey, and retails at $8.57 for an eight ounce bottle.

So after more than 120 years, the medicine originally made in her cellar by a Massachusetts housewife to help the family finances, is still on sale. Even if this should cease to be the case, I suspect that the song will survive and serve to keep Lydia Pinkham fresh in our memories.

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11. J.H Young,*The Medical Messiahs,* Princeton Univ. Press, 1992, p. 22.
12. Marie-Hèléne Gould in a letter to the author observes that an inscription on the back of the photograph, signed by Arthur

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Pinkham in 1949, states: "The first photograph used by Lydia E. Pinkham when the boys suggested that her face be used in the advertising c. 1875-1876. Later the ruff was rearranged, a large brooch was added and a larger comb stuck in her hair." It is described in *Female Complaints* as "the 1879 photograph".

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Today's Lydia Pinkham Herbal Compound

DUNCAN AND FLOCKHART: the story of two men and a pharmacy

Dr P.M.Worling

The history of Duncan, Flockhart and Company and its manufacturing activities has been previously recorded in some detail.[1] This paper looks at the two men John Duncan and William Flockhart, who gave their name to a major pharmaceutical manufacturer, and also at their pharmacy the parent of the company.

John Duncan was the only son of a country surgeon, Robert Duncan and his wife Christian Thomson. He was born at Kinross in the County of Kinrosshire on 26th August 1780 and christened on September 1st.in the same year.[2] There were other children in the family and the christening of two daughters are recorded in the Kinross, Old Parish Register. Anna Duncan on the 15th March 1778 and Margaret Duncan on the 29th. January 1786, both at Kinross.

John was educated at the local parish school and he was also involved in his father's medical practice at an early age. It is recorded that his responsibility was to hold the bowl when a patient was being bled and to check that the right quantity of blood was taken. His early contact with medicine and his observation of the hardships that his father had to face in running his practice, made him decide not to follow in his fathers footsteps and he elected to be a druggist.

In 1794 when John was fourteen years his father arranged for him to start an apprenticeship with a druggist in the Lawnmarket in Edinburgh. This would have been for a five year period, consequently his apprenticeship was completed in 1799 and he probably stayed on for a year or two until 1801 or 1802. In order to gain further experience he went then to London, sailing from Leith because of the cost of the overland route and possibly because of the rigours of the overland journey. In London he worked for Kernoth, druggists of Bear Street, Leicester Square and it is recorded that he was there in 1804.

After he had obtained London experience, he decided to start his own business. The town he chose was Perth, possibly because he had an uncle living there. A small shop was rented and he placed his original order with suppliers in London. These were packed and consigned by sea to his uncle John following later. When he arrived in Perth he found his uncle had refused delivery because of the high charges. Fortunately the shipping company stored the consignment in their warehouse so after the premises were fitted out, he was able to recover the goods and open for business in 1806.

There was some prestige attached to having had experience in London and it is likely John used this to his advantage. He introduced a number of innovations into his pharmacy. His pills were packed in boxes instead of a screwed up paper and he supplied his ointments in pots instead of in mussel shells which were commonly used as ointment containers at that time. This must have helped in overcoming local opposition and competition. The Lord Provost of Perth was a druggist and he was critical of this new business. His opinion was that it would not succeed and he was heard to remark that " ... there's a new druggist come to Perth. I've had to buy up bottles and pots of others in my time - I really have no room for those of this new man."

Duncan was young, enthusiastic and determined to make a success of this new venture. He worked very long hours and made himself available to his customers day and night, living economically and

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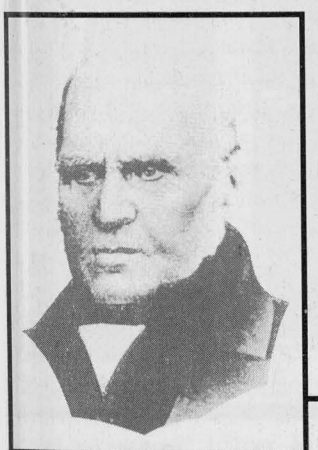
retaining the profit in his pharmacy. Despite his efforts the business was not successful at first, and on more than one occasion, he was near to closing down. In the end, his persistence paid off and his business began to thrive.

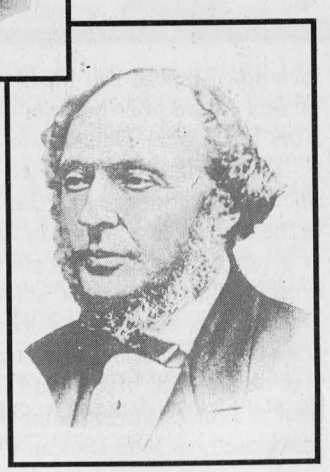
On 20th. June 1808 John Duncan married Elizabeth Morrison, daughter of James Morrison a merchant in Perth.[3] The service was conducted by the Reverend Andrew Thomson, who was some two years older than John and was elected minister of East Church, Perth in March of that year. They became friends and Andrew Thomson was to be of further service to John later in Edinburgh.

By 1812 Duncan was confident enough in the growth of his business to build a large tenement just west of Parliament Close, High Street, Perth and to buy a larger shop nearby. The Perth "cess rolls" show that in 1811 that there was a "... disposition by John Sheddan to John Duncan, Druggist, on tenement and shops, Bunches Vennel, or Meeting House Close on north side of North Street (High Street)".[4]

This was much better situated and his turnover increased rapidly. He also started to manufacture his own preparations which gave him the double benefit of increasing his profit and enabling him to supply goods which he knew were pure, so avoiding adulterated supplies which were then common. At this time new substances were being introduced into pharmacy and he kept abreast of these developments.



John Duncan
(1780-1871)



William
Flockhart
(1808-1871)

It is recorded that he started the extraction of morphine from opium which he sold from his shop. There is no doubt that this was the case, but the date seems too early for it to have been perfected in Perth.

He trained a number of apprentices in Perth and in 1818 he took one of them, a Mr. Ogilvie, into partnership changing the title of the business to "Duncan and Ogilvie". This gave Duncan greater freedom and with his wife he made a number of visits to Edinburgh between 1818 and 1820. Edinburgh was an exciting place at that time. In 1817 Walter Scott, as one of the commissioners appointed by George III to search for the "honours of Scotland" found the Scottish crown jewels in a wooden box in the castle. His novels stimulated a growing interest in things Scottish and life in the North. In 1822 George IV made the first state visit to Scotland of a reigning monarch since Charles II in 1650, who had come North to be crowned king by Argyll, a short lived triumph before Cromwell caught up with him in the following year. The population of Scotland was to more than double during the next hundred years and most of this increase was in the Forth Clyde valley. He saw the business opportunities in the capital and decided to open a shop there.

In 1820 he took over and fitted out a large shop in New Buildings, 52 North Bridge. The business was known as "Duncan and Ogilvie" and he brought James Robertson, an assistant in the Perth shop, to help him in Edinburgh. He also moved his home from Perth to 1 Blenheim Place, Edinburgh at the top of Leith Walk, near to North Bridge.

Duncan was fortunate in his friendship with the Reverend Andrew Thomson who moved to Edinburgh in 1810, and was admitted as a Doctor of Divinity in 1814. By the time Duncan arrived in Edinburgh, Thomson was well established in the community and he recommended his friend by saying ,"... at 52 North Bridge you will get the best medicines". Duncan gave the business his personal attention and it soon became a well known pharmacy in the town. He was accepted in the business community and his entry in the Roll of Edinburgh Burgesses dated 2nd.August 1822 reads, " John Duncan, druggist, Burgess of Edinburgh, Guild brother."

On Christmas Eve 1829 there was considerable excitement around the corner in the High Street. The trial of Burke and Hare and their two wives had just started. They were accused of murdering some fifteen people and selling the bodies to Dr Robert Knox who was Conservator of the Museum of Comparitive Anatomy and Pathology, and the foremost lecturer on anatomy in Edinburgh. All the bodies available went to the University Professor of Anatomy, and obviously Knox thought that he had stumbled upon a new source which he accepted without asking many questions. Hare turned 'King's evidence' and was acquitted together

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with his wife. Burke's wife had a non-proven verdict returned, but Burke was hanged a few days later outside St. Giles. The crowd felt justice had not been done, and Hare and the two wives were chased over the border. Although Knox was acquitted of any blame, his house was attacked and he had to escape through the back door as the mob broke in at the front. Knox continued as Conservator but some years later he had a disagreement with Syme, a director of the museum, which led to his resignation.

In 1832 there was a number of changes. Ogilvie was the junior partner but he wanted to enter into business on his own account, so took over the Perth shop. There is no evidence how successful this venture was, but Pigot's *Commercial Directory* of 1837 shows the shop premises at 75, High Street, Perth listed as "chymist and druggist" and as Duncan, Hamilton and Dandie. Ogilvie may have moved on, but this indicates that there was some *cachet* to Duncan's name in Perth.

Duncan took in two new partners, William Flockhart, and his nephew Anderson, changing the trading title; it is shown in the 1832 *Gray's Annual Directory* as Duncan and Anderson, although it is believed it then changed to Duncan, Anderson and Flockhart. In the same directory his neighbours are shown as James Alison, tailor to the King, and William Cunningham, goldsmith and jeweller, at No.51, and Greig and Miller, silk mercers, at No.53.

Anderson was a surgeon and spent little time in the business. Shortly afterwards he went abroad as a surgeon in the Turkish army and was killed. The title was then altered in 1833 to Duncan and Flockhart, and in 1836 to Duncan, Flockhart & Co.

Like John Duncan, William Flockhart was a native of Kinross. His parents were William Flockhart, a landed proprietor, and Euphemia Mudie, who married at Kinross on 20th. July 1794. There were seven children recorded as being christened at Kinross and William was the sixth, christened on 30th. November 1808.[5] The Flockharts of Annachroich were one of the oldest families in Kinross. An earlier William is listed as one of the jurors in the witchcraft trials at Crook of Devon in 1662, and there was a verbal tradition that one of them had come out in support of John Knox when he addressed the burgers of Kinross in the 1560s.

William's early years were spent at Annacroich on the shores of Loch Leven. He was then apprenticed to John Duncan at 52 North Bridge, Edinburgh. It is possible that the two families knew each other and this led to William being accepted as an apprentice by John Duncan. He was one of the first apprentices at North Bridge; as well as learning the business of a druggist, he studied medicine and surgery and in 1830 was elected a licentiate of the Royal College of Surgeons at the age of 22 years

Duncan and Flockhart had contrasting appearances and characters. Flockhart was tall, had boundless energy and drive. He was outgoing, well known at Surgeons' Hall and an active member of the Volunteers. Duncan was more retiring and his paramount interest was in the advancement of his business and profession. Both men were members of the Edinburgh Merchant Company and founder members of the Pharmaceutical Society when it was formed in 1841.

There were 700 founder members of the Society and nine were resident in Scotland. Of these eight gave Edinburgh addresses including Duncan and Flockhart who both recorded their address as 52, North Bridge.[6] A Society of Druggist - Apothecaries had been formed in 1785 but little is known about it.[7] One of the main points at issue was the difficulty in going to London to take the examinations that had been introduced by the Society and there was some pressure to arrange for a Board of Examiners to be appointed in the North.[8]

In July 1851 at a meeting held in J. F. Macfarlane's shop at 17 North Bridge, Edinburgh, it was formally proposed that a Board of Examiners should be formed in Scotland. This proposal was accepted by the Society and eight pharmacists were elected examiners,

including Duncan and Macfarlane. The first meeting of this Board was held on 24th. February 1852 at York Place when Duncan was elected chairman.

The North British Branch of the Pharmaceutical Society was formed at a general meeting of members of the Society in Scotland in April 1852 at York Place at 9 pm. It was called to elect office bearers and to arrange the holding of scientific meetings. John Duncan was elected President and J. F. Macfarlane Vice-president The second anniversary of the branch was held on 4th. April 1853 in the Society's rooms, then at Princes Street, Edinburgh. J.F.Macfarlan was indisposed, so John Duncan took the chair. After the

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annual report given by the secretary, John Mackay, the meeting was addressed by Jacob Bell. He had travelled around the country and suggested that branches of the Society should be established in Glasgow and Aberdeen. Office bearers and examiners were elected for the following year, but these did not include Duncan who was reducing his involvement at that time.

In the evening a dinner was held at Archers Hall with Dr Douglas Maclagan in the chair. He proposed the toast to the Pharmaceutical Society. Jacob Bell proposed the toast to Edinburgh University and Professor Christison, and Mr Mackay proposed the health of Mr Bell, traced the progress of the Pharmacy Act and Mr Bell's work in connection with it. Jacob Bell replied at length. Then followed other toasts, Flockhart proposing the one to the strangers ~~present~~

William Flockhart served as President for the 1857 -1858 session, having been proposed by J.F.Macfarlan. In his presidential address on 13th.November 1857, he dealt with some of the problems that were troubling the profession. The Poisons Bill was then being discussed and Flockhart agreed that public safety should be assured and that alkaloids such as strychnine, veratrine and aconitine, and prussic acid should be controlled, although he believed that preparations of opium in daily use should not be included. He pressed for the introduction of a "Universal Pharmacopoeia for Great Britain" so that the problem of different strengths and doses could be avoided. The patient prescribed muriate of morphia in Carlisle with a dose of forty drops, had to increase this to sixty drops when he was in Edinburgh. He was also very critical of an Edinburgh chemist who was producing laudanum using methylated spirit instead of rectified spirit; all those present condemned this.

1838 had seen the death of William's young brother Robert at the age of 25. He was the only surgeon aboard the brig-of-war "Brisk" and while engaged in suppressing the slave trade some 100 miles south of Cape Sierra Leone he, together with most of the officers and crew, were taken ill with a fever which he did not survive.[9] Earlier, Robert had assisted Dr. Knox of Edinburgh to open the head of Sir Walter Scott in order to weigh his brain for analytical purposes. This must have been in 1832. As a souvenir of this operation Robert had a lock of Scott's hair which was passed down in the family.

Some years previously, Duncan had moved from Blenheim Place to a house at 7 Dundass Street, Edinburgh. In 1839 he moved again, buying a farm, "Burnhead", at Liberton on the outskirts of Edinburgh. He commuted daily by pony to his business and took a great interest in cultivating medicinal plants some of which were used in the pharmacy.

There is no doubt that William Flockhart brought new energy to running the business. He was largely responsible for managing North Bridge and because of the continuing success of the business it was decided in 1846 to open another branch at 139, Princes Street, Edinburgh

In 1846 Duncan was 66 years of age and decided to reduce his business commitments. New partners were introduced, David Hunter, Christopher Newton, Wardlaw MacFarlane and William Tait. Duncan sold part of his share to the four partners but remained as senior partner, with Flockhart as managing partner. At the end of the year Elizabeth died aged 58 years and was interred in Liberton churchyard".[10]

Duncan cultivated his relations with the medical profession. He helped Sir James Murray with supplies when he was experimenting with fluid magnesia, and he in his turn, had been of assistance in obtaining the Royal Warrant. He also made preparations for James Young Simpson, Professor of Midwifery, including various ethereal tinctures. Simpson was using ether in his practice but continued to search for a more satisfactory anaesthetic, particularly one which was less irritating on inhalation and could be used in smaller doses. David Waldie was a Scottish surgeon whose main interest was in chemistry. About 1839 he took over the post of chemist to the Liverpool Apothecaries' Company from Dr. Brett. He found that the chloroform (or chloric ether) which was being used for the treatment of hysteria was impure and contained significant quantities of alcohol. Waldie was aware that chloroform had been tried as an anaesthetic in early 1847 with unsatisfactory results. Due to its impurity; he was able to devise a method for the manufacture of pure chloroform.

On a visit to Scotland he met Simpson and suggested that he should try chloroform, promising to supply it in the pure form to him once he returned to Liverpool. Unfortunately the laboratories of the Liverpool Apothecaries' Company had been destroyed by fire and were not yet back in operation, consequently Simpson asked Gregory, Professor of Chemistry at Edinburgh University, to supply a sample. Subsequent experiments by Simpson in November 1847 proved its value as an anaesthetic and it was natural that he should then turn to Duncan & Flockhart for further supplies. It was fortunate that they were able to respond to his request as the subsequent development of chloroform and other anaesthetics was a major factor in the expansion of their pharmaceutical manufacturing business.

There is some controversy about the first manufacture of chloroform. Whittet repeats the comment made by Dilling that Duncan and Flockhart could have obtained Waldie's method from Simpson.[11] However, Simpson in his paper of December 1847 states that the chloroform made by Duncan and

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Flockhart was to the formula of Dumas; Dumas was present at the first public surgical trials in Edinburgh that year so he was closely involved.[12]

Eve Blantyre Simpson, Simpson's daughter, in her book on her father wrote, "Mr Waldie promised to send the one he recommended but it did not come and Duncan and Flockhart supplied it. The partners sat up until 2 a.m. to brew the first perchloride of formyle Professor Simpson used. The half ounce was soon used up and Mr Hunter of Duncan and Flockhart had to work hard with an ordinary retort to supply the demand from 52 Queen Street."

However, any controversy was soon forgotten in the rush to meet the demand. In January 1848 the *Pharmaceutical Journal* commented that, "... the demand has been so extensive that those engaged in its manufacture were unable to produce it fast enough, so a great number of new makers have sprung up"[13], and there was concern "... for Druggists to ascertain that the article they were selling as chloroform is such as it ought to be." The *Journal* also mentioned that supplies were being imported from Scotland and Ireland without paying duty which was 'injurious' to the English producers because of the difference in spirit duties in the three countries.[14]

There were problems with the quality of the chloroform being supplied, some was unstable and some had very little chloroform in the preparation. Gregory continued to take an interest in the question of quality. In 1850 he pointed out that some chloroform caused nausea and headaches due to the impure volatile oils present. However, he said "... that the quantity of volatile oils present in the chloroform was always so small that the product was fit for use, and only caused headache in a few particularly sensitive persons"[15]

Chloroform was manufactured at North Bridge by David Hunter. There was a growing demand which was boosted by the outbreak of the Crimean War in 1854 but it was not until 1876 that a manufacturing unit for the company's preparations was opened in South Bank, Cannongate, separating the manufacturing from their retail activities. Eve Simpson reported that by 1895 the company was producing three quarters of a million doses weekly.

Duncan married Ann Craigge Dick of Perth at Liberton on 30th September 1848, continuing for the time being as senior partner. He resigned in 1853 from the company he had founded and settled in his farm. Christopher Newton resigned two years later and for the next ten years it was managed by Flockhart, Hunter, MacFarlane and Tait. The premises moved from 52 to 6 North Bridge because of rebuilding but otherwise the pharmacy continued to serve the local community.

By 1860 William was 52 and in this year he married Jane Henderson on 31st October. There are three children recorded as being born, William in 1861, John in 1862 and their daughter, Jane Edith, in 1870.[17] William's wife died just before her husband in 1871.

David Hunter died in 1865 at the age of 52 years. His cause of death is given as "chronic dyspepsia many years and a fever for four weeks."[18] He had continued to be responsible for the manufacture of chloroform in the basement of the pharmacy and it is possible that the continued inhalation of its vapours contributed to his early death.

William Flockhart, who was considered to be the man of energy, pre-deceased John Duncan, dying at Annachroich on 24th. August 1871 at the age of 62.[19] The farm at Annachroich had descended to William's elder brother, Henry, on the death of their father in 1819.[20] In 1867 Henry decided to retire because of failing health and he disposed of the farm to William who at that time owned another farm at Easter Coldrain to the north west of Annachroich. Henry moved to Inverleith Row, Edinburgh, with his sisters, where he died in 1881.The house at Annachroich continued to be linked with the family up to the death of the last Miss Flockhart in 1931.

John Duncan died at his farm "Burnhead" at the age of 91 years on 13th. September 1871.[21] His death was registered at Liberton by his grandson, also John. There must have been a close bond between grandfather and grandson. Dr John Duncan, FRCS, was one of the most expert of Edinburgh's surgeons. Educated at Edinburgh Academy, he gained an M.A. before starting medicine, graduating M.D. in 1862. He was appointed house surgeon under James Syme who held the chair of Clinical Surgery. Known as the 'Napoleon of Surgery', Syme was considered the greatest surgeon of his day. Dr John Duncan's obituary ended with the words, "... a man of magnificent presence and exceedingly like the late Emperor Frederick of Prussia, he died 24th. August 1899 at Kinloch, Skye, aged about 60 years."

John Duncan's widow, Ann Dick, died in the July of the year following her husband's death.[22] The farm was purchased by Sir John McNeil, whose wife Lady Emma McNeil was the sister of the Marquise of Lorne. The Marquise's wife, Princess Louise, was a frequent guest at the house which was famous for its beautiful gardens and the glass conservatory connecting the road with the front door. This was built, it is said, to enable Princess Louise to pass from her carriage to the house protected from the elements. A feature of the house was a suite of four rooms which were known as the 'Royal Suite'. The house was occupied until 1957 when it fell into disrepair and was pulled down.

The retail pharmacies at North Bridge and Princes Street continued in business under the title of Duncan, Flockhart & Co. for many years. Although the retail company was the parent of the manufacturing unit, as the manufacturing turnover increased the retail shops played a subsidiary role. In 1953 the shop in Princes

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Street was closed and in 1958 the title of the retail business was changed to Duncan, Flockhart (North Bridge) Ltd..

With the introduction of the National Health Service there was a growing emphasis on dispensing. This coupled with the gradual movement of the population out of the centre of Edinburgh put the pharmacy at a disadvantage. It came to rely more and more on passing trade and counter sales to make a profit. Two Edinburgh pharmaceutical companies, J. F. MacFarlane and T. & H. Smith, had amalgamated to form MacFarlane Smith and in 1962 Duncan Flockhart also joined this group, so creating Edinburgh Pharmaceutical Industries. This group joined Glaxo in 1963. The wholesaling interest of the Glaxo companies was consolidated in a new company Vestric Ltd. in 1966 and the retail pharmacy at North Bridge was part of this consolidation. Its title was changed to North Bridge Pharmacy Ltd., thus ending its association with the original founders.

At that time it was considered that a retail pharmacy did not fit well with a wholesale distributor because it was in competition with the wholesalers' other customers and in 1971 North Bridge Pharmacy was sold to Park Chemists of Whitley Bay. After continuing to trade for a further five years it was closed in 1976, ending 156 years of pharmacy retailing on North Bridge Edinburgh.

References.

1. *The History of Duncan, Flockhart & Co.*, Duncan Flockhart & Co., Edinburgh and London, 1946; S.Blackden, *A tradition of Excellence,* Duncan,Flockhart & Co.; *Distinguished Men of the County,* Kinrosshire Advertiser,1932; *Glimpses of Kinrosshire in the Past,* Kinrosshire Advertiser,1935.
2. Parish Register, Kinross, 462, 1780. Christening of John Duncan.
3. Parish Register, Perth, 387, 1808. Marriage of John Duncan and Elizabeth Morrison.
4. Cess Rolls, Perth, B59/9/2,pp.cxiib-cxxvi a.
5. William Flockhart and Euphemia Mudie were married on 20 July 1794 at Kinross and the following children were christened there:

Ann	23 Oct1796	Robert	14 Apr 1805
Isabel	24 June 1798	William	13 Nov 1808
Euphemia	11 May 1800	Robert	31 Aug 1813
Henry	22 Mar 1803		

6. The nine founder members of the Pharmaceutical Society resident in Scotland recorded are:
   H.C.Baildon, 73 Princes St.,Edinburgh.
   W.R.Davenport, 20 Waterloo Place, Edinburgh.
   J. Duncan, 52 North Bridge, Edinburgh.
   W.Flockhart, 52 North Bridge, Edinburgh.
   James Gardner, 58 George Street, Edinburgh.
   Robert Lindsay, 58,Elm Row, Edinburgh.
   John Mackay, Secretary, 55 George Street, Edinburgh.
   James Robertson, 35 George Street, Edinburgh.
   Gavin Stiell, Chalmers Street, Dunfermline.
7. Not much is known about its activities but it is believed its committee was responsible for arranging occasional meetings in Edinburgh after 1841.
8. A brief History of the Scottish Department, Pharm. Soc.of G.B.,1952; North British Branch, *Pharm.J,* 1852-3, **12**,pp.530,574.
9. The gravestone at plot 84 in Kinross Kirkgate graveyard has the following: "Late Wm. Flockhart of Annachroich, yt s Robt MD RN [died] 27.12.1838 [aged] 25 at sea on board brig-of-war Brisk 100 miles to South of Cape Sierra Leone only surgeon on board whilst actively engaged in suppressing slavery in that pestilential climate where he fell victim to fever with nearly all the officers and crew"
   [On south side] Wm Flockhart of Annachroich [died] 2.7.1819 [aged]59, whose w[ife] Euphemia Mudie[died] 1.7.1836 [aged] 67.
10. The gravestone at plot 169 in Liberton churchyard, has the following: "In memory of Elizabeth Morrison wife of John Duncan, Burnhead, who died 22nd. December 1846, aged 58 years; also John Duncan of Burnhead who died 13th. September 1871,aged 91 years; also Anne Craigie Dick his widow who died 21st. July 1872 aged 68 years.
    In memory of James Duncan MD,FRCSE, son of John Duncan, Burnhead, died at Tours 16th. August 1866, aged 55 years. In memory of Andrew Balfour Duncan, HM 57th.Regt., son of James Duncan, MD, Edinburgh, died at Taranaki, New Zealand, 4th. June 1864, aged 23
11. T.D.Whittet, "Liverpool Apothecaries' Company", *Chem. Drugg.*, 1963, 179 p.233.
12. J.Y.Simpson, *Prov.Med.Surg.J.*, 29 Dec.1847,p.698. "Chloroform made by Duncan & Flockhart & Co., chemists, Edinburgh is made by the formula of Dumas:

R Chloride of lime in powder	lb IV
Water	lb XII
Rectified Spirit	f.oz.XII.

    Mix in a capacious retort or still and distil as long as a dense liquid which sinks in the water with which it comes over, is produced. The product obtained by the above process is rectified by agitating it with several portions of strong sulphuric acid and afterwards distilling it from carbonate of baryta. Messrs.Duncan & Co. inform me that they always distil it a third time from lime and they believe it would be impossible for them to furnish it perfectly pure without this. Latterly they have made and sent out from 60 to 80 ozs per diem (2s. per oz.) manufactured by this process. Of several specimens I bought in Glasgow, only one was of the proper strength and purity. I bought a specimen yesterday in an Edinburgh shop sp.gr.1.130 instead of 1.480. There was little or no chloroform in it.
13. Chloroform, *Pharm.J.*, 1847/8,vol.7,p.344.
14. Importation of Chloroform from Scotland or Ireland, *Pharm.J., 1847/8,*vol.7,p.462.
15. W.Gregory, "Notes on the purification and preparation of chloroform", *Pharm.J.,*1849/50, vol.9, p.580.
16. Ann Craige Dick was christened 26 July 1804 at Kinnoul, Perthshire, her parents being William Dick and Ann Cramond. Their marriage is in the parish register, Midlothian, Liberton, 693/8, 1848.
17. The children of William Flockhart and Jane Henderson recorded as being christened at Leith, Midlothian are:

William	12 August 1861
John George Henderson	16 November 1862
Jane Edith	22 September 1870.

18. David Hunter, Death Certificate, Newington, 1865.
19. William Flockhart, Death Certificate, Kinross, 1871
20. John Duncan, Death Certificate, Liberton, 1871
21. See ref. 10.
22. Ibid.

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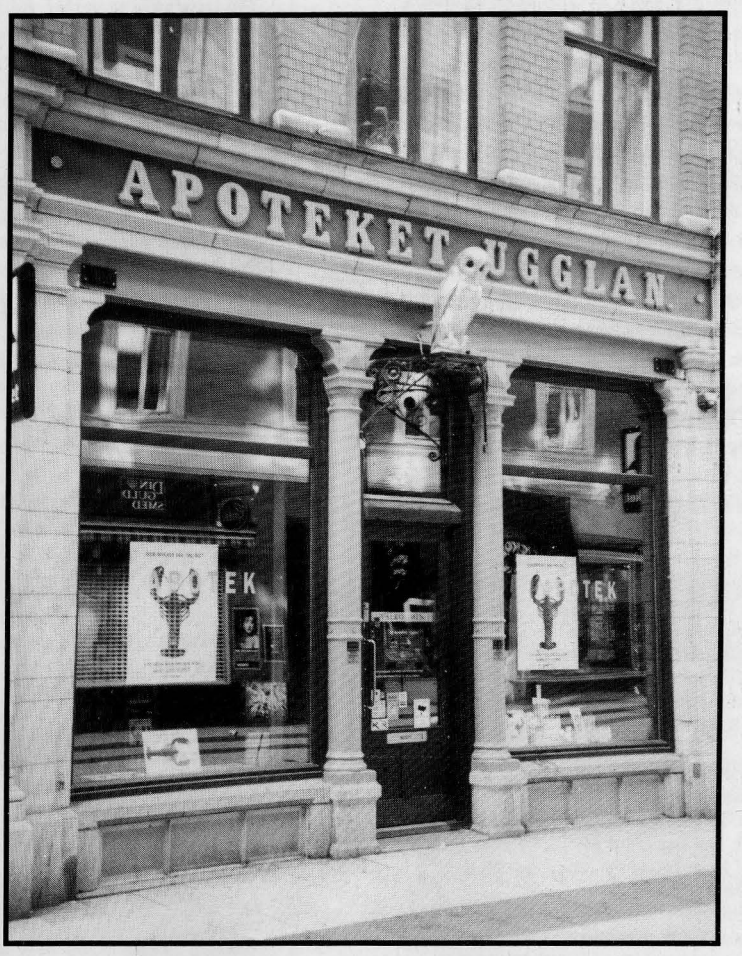

Those who were at the International Meeting in Stockholm, June 1997, will remember the fine Owl Pharmacy in Drottninggatan founded in 1761

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The *Historian* Index.

Members should now have received their copies of the newly published *Index* to this journal, which covers the entire period of publication of the *Pharmaceutical Historian* from the first issue in 1967 to the end of 1995. This valuable index is the key to the rich store of historical information which resides in the pages of back issues of our journal and will be of considerable value, for a long time to come,to all concerned with the history of pharmacy and medicine. The Society would wish to take this opportunity of expressing its grateful thanks to Mrs Jean Runciman, who gave freely of her expertise, and a considerable amount of time, in order to compile the document. A photograph of Mrs Runciman at work on the project was included in our March issue earlier this year.

Our thanks are also due to Glaxo Wellcome plc who so kindly sponsored the printing, and to our editor Dr Burnby and our printers, Inprint Services of Ashbourne, for bringing the project to final publication.

John Hunt.

Stourbridge Meeting.

On Friday, 12 June 1998, a very successful meeting was held jointly with the Dudley and Stourbridge branch of the Royal Pharmaceutical Society. More than fifty people attended, including BSHP members who had travelled many miles to enjoy the presentations and buffet. The speakers were:

Mr C. Hajdamach, principal curator of Broadfield House Glass Museum on, "Glass making in 19th. century Stourbridge - the Golden Age."

Mr W.A.Jackson of BSHP on, "Looking at old glass in the pharmacy."

Our thanks go to the branch secretary, Anne Johnston, for organising the evening and to the local branch members for their hospitality.

Review.

Pack up your Medicines - an account of the work of pharmacists in the Services during the Second World War by C.V.Hammond. Purnvic Books, Southport, 1998, pp.413, 21 illus., drawings, 8 appendices. £26.50. ISBN 0 9532330 0 6.

Pharmacists who served in the armed forces during the second World War, and the many who followed them in National service days, will find considerable interest, and not a little nostalgia, in this book but it would be wrong to suggest that its readership should be so limited. Disease and injuries have always taken a heavy toll in armed conflicts, and the major contribution made by pharmacists, on the battlefield, in casualty stations, military hospitals, troopships and in medical supply work deserves to be more widely recognised. Victor Hammond is to be congratulated on the years of work he has invested in recording the experiences of pharmacists.

Partly autobiographical, based on his experiences in the Royal Army Medical Corps, but supported by reports of the experiences of others, the author traces progress from apprenticeship days, through enlistment and service at home and abroad, to the homecoming in 1946. Like all accounts of service experiences, the text includes numerous abbreviations referring to service units and procedures which will be unfamiliar to many readers. Fortunately, the author provides a useful glossary of these, and also of Hindi and Urdu words used during Indian military service, some of which have entered our language.

The appendices include lists of pharmacists posted overseas, those taken prisoners-of-war, accounts of individual experiences, and notes on pharmacists awarded the Military Cross. The book is well referenced and will be a useful source for those wishing to read further into the subject.

One cannot but be impressed by the resourcefulness of the young pharmacists, many scarcely out of college, who used their knowledge and ingenuity to overcome shortages under difficult working conditions, in order to maintain medical and pharmaceutical services. This book is both a tribute to them and a record of their work.

John Hunt.

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The eighteenth century pharmacy at 60, High Street, Tenterden, Kent.

H.V. Roberts.

Tenterden is a small market town in the Weald of Kent with a population today of about 6,000, but which also serves a large rural area. Today there are three pharmacies in the town, one of which can trace its origin to 1790, and a second to the early nineteenth century when the population of the town was just over 3,000. The third pharmacy opened after the second World War when the population was beginning to rise to the present figure.

Although Tenterden is now ten miles from the sea it has been a member of the Confederation of the Cinque Ports since 1449. This was due to the ship-building activities in the fifteenth and sixteenth centuries of the former river port of Smallhythe, two miles to the south on the earlier course of the tidal River Rother. At Smallhythe at the end of the sixteenth century, Henry Badcock had a thriving general store dealing in grocery, drapery and stationery, but also in spices, such as pepper, nutmegs, ginger, cloves, cinnamon, saffron and oil of bay; he also sold red and white sanders, vinegar, quicksilver, turpentine, aqua vitae, sugar and honey, and gunpowder.[1]

In Tenterden itself at about the same time, Daniel Boughtwhat also sold drapery goods, haberdashery, stationery and grocery, while his pharmaceutical stock included much the same spices including cummin seed, also frankincense, alum, starch, rosin, brimstone, treacle, soap, beeswax and sugar candy.[2]

The medical needs of Tenterden were catered for by a succession of apothecaries and surgeons such as Henry Milborne. His probate inventory in 1575 included 46 glasses "great and smale with certeyne waters in them", 43 "paynted potts", 100 other earth pots, "certeyne instruments belonging unto Surgerye, certayne grocerye wares, dredge powders, salves, oyntments with other suche like." [3] There were also three pairs of scales or balances, brass weights, various sieves, wooden boxes, as well as 'stone', pewter and glass bottles, some in wicker baskets. He left his brother Edward Milborne of Hastings. also an apothecary, "all suche potticarye ware as I have in my shopp w'th my instruments, grossery wares, spices, potts and all other thinges apperteyning to my science."[4]

The poor of Tenterden were treated in their homes, and as early as 1560, in the poorhouse by other apothecaries and surgeons.[5] In 1650 John Cumber, barber surgeon and property speculator, was paid by the Overseers of the Poor ten shillings for "dressinge of Widdow Fercie's legge". William Ockenden, apothecary, received £1 for curing Thomas Wattle's arm and William Gunne's breast, while his wife, Elizabeth, was paid £2 0s.8d. for "physick, salve and cures". Thomas Winder, surgeon, charged the Overseers £2 for dressing Widow Siggins' leg and 6s.6d. for ointment and "playsters". In 1692 Drs Back and Curteis presented bills for £3 5s.0d. and £9 17s.6d. respectively for physic, whilst in 1685 an itinerant medicine seller, "the Mountebank", was paid ten shillings for curing John Norden's knee. In the 1670s "plaisters, ointments, cordialls and powders" were obtained from Mrs Susan Butler's general store in the High Street.[6]

In 1726 Jeremiah Cliff was appointed apothecary to the poorhouse. A few years later he purchased the late Mrs Butler's old timber framed house, demolished it and replaced it with the existing attractive brick-built house, now No.22 High Street.

Jeremiah Cliff's copy of the *London Pharmacopoeia* of 1721,with many notes in his own hand, has survived and was the subject of an article by Philip George in the *Chemist and Druggist* of 28 August 1954.[7] During his many years of practice as an apothecary, Jeremiah Cliff kept a record of the cause of death of everyone who died in Tenterden between 1713 and 1743, togther with the names of the medical practitioners attending. This is now in the County Archives at Maidstone.[8]

William Medhurst in 1734 paid the Tenterden council a fine, in effect a licence fee, "for using the Mistery of an Apothecary".[9] The last person to describe himself as an apothecary was John Mace who came to Tenterden in 1755 as an apprentice to William Lott. He built himself a large house in the centre of the High Street (now occupied by the Kent County Library) and set up in practice with his son.[10]

Several shopkeepers at the end of the eighteenth century described themselves as 'grocers and druggists' and in 1790 John Breden, the parish clerk, opened a bookshop which included the sale of patent medicines at what is now 60, High Street, a timber framed hall house built about 1480.

The open hall had been floored over in the sixteenth century with the insertion of a brick chimney stack still in place, and was later joined under one roof to an adjoining sixteenth century timber framed two-storey building.[11] The narrow between the two structures is clearly visible in the exposed timber framing on the upper floor of the present building and may be traced in the lay-out of the shop and dispensary below. Later additions and alterations were made in the eighteenth and nineteenth centuries and more recently. The dispensary is now in the fifteenth century

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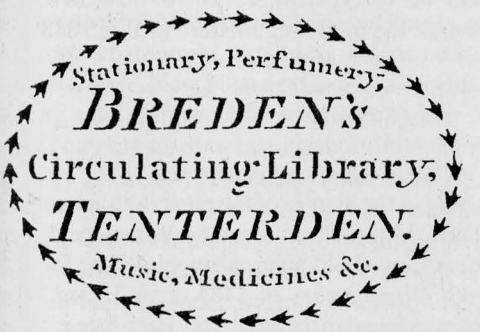
part and the cosmetic department in the sixteenth, whilst the bookshop is in the nineteenth century rear extension. Behind the shop is a large garden with an ancient and flourishing mulberry tree, and a tall ginko. Up to 1970 a large nineteenth century iron mortar stood on a wooden mortar stand outside the back door of the dispensary.

John Breden's shop was probably in the sixteenth century part of the building with his living quarters in the older part which remained as the domestic area until after 1950. The stencil Breden used for advertising purposes refers to "stationary [sic], perfumery, music, medicines etc.", but apart from this brass stencil plate no list of his stock has survived. He had been appointed parish clerk in 1765 when aged thirty, but resigned in 1794 four years after opening his bookshop. He continued, however, to take an active part in church affairs until his death in 1810 and is commemorated by a handsome headstone in St Mildred's churchyard on which he is described simply as 'Bookseller'.[12]



In the 1823 directory of Tenterden, the list of 'professional persons' includes two surgeons' practices, (Thomas Bishop & Sons,and John Mace - the former apothecary - & Son), three solicitors, an auctioneer and surveyor, and James Teasdale 'druggist etc', while David Espenett 'Grocer and druggist' is listed under 'shopkeepers'.[13] This is possibly an indication of the growing specialisation which was to transform the bookshop with its proprietary edicines into the chemist's shop of the next generation; there is no instance in Tenterden of an apothecary's business becoming a pharmacy.

James Teasdale in 1825 leased the premises at 60,High Street to William Maylam, 'Chymist & Druggist' at £30 a year.[14] The notebook in which the twice yearly payments of £15 are recorded, also includes a list of the dryugs and galenicals held in stock with cost and retail prices. There are 629 items in all including nine salts of mercury, nine different barks (each whole and in powder), nine 'folia', two sorts of saffron(stigma and placenta), sixteen plaster masses, thirty essential oils, ten salts of potash. There were 29 different roots (mostly also in powder form), eighteen varieties of seeds, thirteen syrups and 48 tinctures, as well as 29 'gums' including Gum Opii (from which Maylam also made his tincture) which retailed at 4d.for two scruples or 5d. for one drachm. Tonquin beans sold at 9d. each, their persistent aroma being much prized in a snuff box, and were still a regular stock item in the 1960s.[15]

The book also contains recipes for making galenicals, a few veterinary medicines including blister ointment for horses and six formulae for foot-rot, hiera picra, lotions for the 'Itch', Godfrey's Cordial, drops, mixtures and powders for the 'Ague' and chilblain wash. Bitters, ginger beer, curry powder, cosmetics such as lavender water, rose water, lipsalve and cold cream, toothpowder, blacking, harness varnish and ink were also made.

To make Milk Punch, "Steep the parings of seven lemons in a pint of brandy for three days, then squeeze the lemons, and as many Seville oranges intact, add Brandy and Rum of each three pints, and three pints of water, grate a nutmeg into two quarts of boiling milk and add to the above, two pounds of double refined sugar, pour in the other ingredients, stir well together. let stand twelve hours, then strain through a jelly bag till it is quite clear."

Also listed are nine varieties of snuff, 21 kinds of candy and lozenges, nineteen pickles and sauces, and at the back, instructions for "Lettering with Black Ground: Write with white paint on Glass, then turn it over and paint between the let[terin]g with black paint, let it dry for 3 weeks, then wet the let[terin]g with Isinglass and cover with Gold and repeat it again."

During some alterations in 1970, a printed leaflet dated Jan.3.1837 was discovered at the back of a drawer,(one of a nest of drawers dating from the early nineteenth century) which read:

"W.Maylam returns his grateful acknowledgements to the Inhabitants of Tenterden and its vicinity for the kind support he has received during the last Twelve years, and embraces this opportunity of informing his friends, that in addition to the various branches of Chemist and Druggist, Bookseller, and Stationer, he intends to add that of BOOK-BINDING; and trusts by attention to liberal charges, and strict attention to all orders, to merit a continuance of their favors.[sic]

Periodicals promptly delivered."[16]

Unhappily William Maylam died later that year and the business of 'Chymist & Druggist, Bookseller & Stationer, stamp distributor and agent for Packham's rupture trusses' (and bookbinder) was taken over by Henry Smith.[17]

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At about the same time, his namesake, Alfred Smith, opened a second chemist & druggist's shop in the High Street in a house with a fine eighteenth century shop front which has been preserved, although no longer a pharmacy. Alfred Smith was followed by G.Wilkins, W.E.Manby in about 1878, then D.T.Wilkie in 1894, and then by Henry Meynell from about 1900 until taken over in 1955 by Boots. Eleven years later Boots moved to larger premises in a new parade of shops. A third pharmacy was opened after the second World War by the Ashford Co-operative Society.

At 60, High Street, Henry Smith was followed in 1842 by Thomas Bolton, aged 29, whose membership of the Pharmaceutical Society dates from that year.[18] He subscribed to the *Pharmaceutical Journal* but many of the pages in the 24 issues of 1860 and 1861 were still uncut when they were found a century later in the attic, tied in neat bundles. In 1859 he subscribed a guinea to the Jacob Bell Memorial Fund, and five shillings to the Benevolent Fund.

Bolton's prescription book of November 1847 to May 1852, the only nineteenth century one to have survived, contains copies of about a thousand prescriptions on its 212 pages. Some of them are signed by the physician, J.E.Mace, grandson of the apothecary John Mace. Most of the prescriptions would have caused few problems in a pharmacy of the 1960s, but today go straight to a 'specials' service.

A typical prescription for a mixture and pills is:

R	Ext. Tarax.	fl.dr. i
	Aq.Menth.Pip.	fl.oz .viss.
	Potas. Nit.	dr.ii.
	Tr. Card. Co.	fl.dr. vi
	Tr. Camph. Co.	fl.dr. ii
	Syr.Aurant.	fl.dr. iv.

Capt. Coch. amp.ii bis die.

R	Pil. Galb. Co.	gr. xiv
	Hyd. Chlorid.	gr. vi
	Saponis	gr. iii
	Ext. Hyosc.	gr. vi.

M.ft. pil. vi. Capt. ii o.n.

1s.6d. was charged for the mixture and 6d. for the pills. 1s.6d. was the average price for an approximately 8 oz. mixture (about £2.50 today), 1s.3d. for 6 oz., 2s. for 12 oz., 6d. for 6 pills, 1s. for 24, and 4d. for a 1 oz. ointment. The following examples suggest that little account was given to the time taken in dispensing when pricing prescriptions:

Mrs Thos. Witherden

R	Pil. Hyd.	gr. iii
	Hyd. Chlorid.	gr. ii

M.fiat pil. h.s.s.

R	Infus. Sennae	fl.oz. i
	Tr. Card. Co.	fl.dr. ii
	Magnes. Sulph.	dr. iii
	Manna Opt.	dr. i

M. ft. haust. mane sum^{d}.

The price charged was 8d. for the two.

Mrs W. Moireli

R	Bismuth Trit (Tris[ub]pnit)	dr. i
	Ammon. Carb.	dr. ss
	Mucilage	fl.dr. iv
	Mist. Camph.	fl oz. viss.
	Tr. Lupuli	fl.dr. iii
	Syr. Aurant.	fl.dr. v.

M. Capt. Coch. amp. ii bis die.

This was priced at 1s.3d.

Draughts (haustus) dispensed as a single dose, usually of one and a half ounces, were prescribed as often as mixtures, and there were numerous prescriptions for powders, both in bulk and "div. in chart." (single doses wrapped in paper), ointments, suppositories with a base of hard or 'Spanish' soap, embrocations, an occasional electuary, and a breast plaster freshly prepared (6d.). In April 1850 there were two prescriptions, from different doctors, for Ol. Jecoris Aselli (cod-liver oil) first recommended in 1847 for the treatment of consumption.[20]

Older remedies still occasionally appeared, and it would be interesting to know how Mr Bolton dispensed the following mixture in July 1848:

R	Conf. Mithridat.	dr. ii
	Vin. Sem. Colch.	
	Spt. Ammon. Co.	aa fl. oz.ss.
	Aq. Pulegii	fl. oz. v.

Capt. Coch. mag. iii pro re nata.

A note in the margin of the prescription book reads: "Conf. Mithridat. as made by Winstanley - from a form. in Lewis' old pharmacopoeia". The formula in *Lewis's Dispensatory* of 1785, a well used copy of which was found in the attic at 60, High Street, contains 45 ingredients.[21]

Together with William Maylem's notebook,the prescription book and *Lewis's Dispensatory,* a number of recipe books have survived in Thomas Bolton's handwriting containing formulae similar to Maylam's but with a greater number of non-medicinal items. With only four or five physicians' prescriptions a week most of the chemist & druggist's time was occupied in making such things as harness paste, baking powdeer, pot-pourri, bears' grease, anchovy paste, marking ink and marine glue. He also made pounce, eau-de-Colgne, lavender water, cold cream, violet powder, permanent and blue inks, Hungary Water, mushroom ketchup, white cement (made with oyster shells and albumen) and rifle black.

A small notebook contains recipes for varnishes: white (for paper), for pictures, for iron, for grates, hard varnish, copal varnish and drying oils for varnishes and gold lacquer (using turmeric, gamboge and annatto). There are directions for cleaning marble, polishing enamelled leather, drenches for cows, a lotion for swollen udders, horse powders and foot-rot applications.

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Among Bolton's regular customers was Thomas Buss Shoobridge, junior, a prosperous farmer whose account with Bolton from 1849 to 1864 is recorded in a small hard-cover pocket book closed with a metal clasp (supplied by 'Bolton Bookseller Tenterden)[22]. Recurring items include 'Hard's Farinaceous Food', 25 entries in 1851, fifteen in 1853 and then no more, 'Magnesia', forty bottles at 8d. each in 1849, seventeen in 1850, fifty in 1851, then about one a month and after 1854 only occasionally. This may have been Bolton's own preparation but Dinneford's Magnesia could be bought at that time at 5s.6d. in half gallon Winchesters for dispensing. Advertisements in the *Pharmaceutical Journal* by Dinneford & Co., Chemists of 172 Bond Street quoted a notice in the *Journal* of May 1846 claiming that, "This solution may be fairly taken as a type of what the preparation ought to be." [23]

Among possibly prescribed medicines supplied to Shoobridge are pills, mixtures, draughts, powders, salts and an occasional ointment, embrocation, lotion and plaaster. There are several purchases of lozenges, Seidlitz powders, castor oil, rhubarb and ginger, senna, arrowroot, chamomile, liquorice, ipecacuanha and antimonial wine. hiera picra, hartshorn, sal volatile and smelling salts. Proprietary medicines appear in the account on only three occasions in the sixteen years, Holloway's Pills in 1852, Welch's Pills (2s.9d.) in 1860 and Nervine in 1862.[24] A truss was supplied in 1860 for 12s., and quinine on two occasions in 1862.

Among cosmetics and perfumery, Shoobridge bought violet powder, lavender water, cold cream, lipsalve, toothpowder, 'powder papers', bouquet perfume, hair oil and Rowland's Macassar Oil which cost 3s.6d. then and the same price a hundred years later; he had two bottles in 1857 and a further twelve bottles spread over the remaining years of the account up to 1864. There were also a powder box and puff, four hairbrushes, two sponges and fifteen purchases of soap.

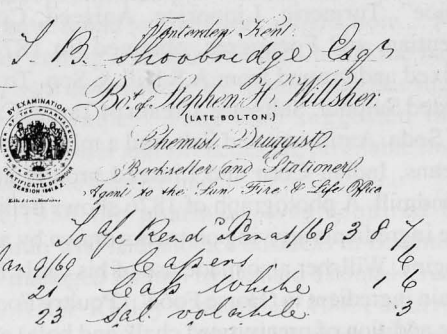
Grocery items included honey, sugar, sage, cochineal, ratafia, salad oil, anchovies and anchovy paste, and treacle. Coffee at 5d. for a quarter of a pound, cocoa, lemons at 9d. each, essence of lemon, curry powder, Worcestershire Sauce, capers and pickles, were also bought. Lapsong tea at 2s.2d. a half pound was purchased about once a month from 1857 to 1861, and then 'mixed tea' at a shilling a quarter two or three times a month. There were several purchases of blue vitriol and blue stone, milk of sulphur, turpentine, chloride of lime and creosote, polish and fly powder, also horse balls and linseed meal. Candles were bought in 1849 and again in 1857, 1858 and 1859, but in 1857 there were five entries for half gallons of colza oil, presumably for lamps, with further supplies in 1858 and 1859.

From the book and stationery department were regular supplies of writing paper and envelopes, sealing wax, ink, matches, marking ink (both Bolton's own and Bond's), a diary and notebooks. There were also seventeen books, including *Twelfth Night* in 1863, and *What to Eat* in 1849 at the time whenMr Shoobridge was buying a bottle of 'Magnesia' almost every week. It is not clear whether 'Wishing' and 'Bow Bells' are books or music, but the latter appears separately in the accounts of 1858,1859 and 1860. Shoobridge married about 1850 and it is tempting to visualise a child being given Hard's Food (1851-1853) up to the age of four, and then learning to play the piano from nine to eleven years of age.

There are four entries for book-binding in 1856 and three in 1857. A year's deliveries of newspapers were charged at 28 shillings in 1850 and 38 shillings in 1851. From 1857, following the abolition of the newspaper tax, a charge of 4s.4d. a year was made on 'London Journals'. Mr Shoobridge also bought his cigars from Bolton in 1849 and 1850 but only occasionally in 1851 and 1855.

Long credit was normal. The bill for goods supplied in the twelve months from January to December 1849 was settled in March 1850, that of 1850 in October 1851; the account covering January 1851 to December 1855 in June 1856 (after deducting 2s.8d. for returned empty bottles), and the bill for 1857 to 1858 in November 1859. Goods supplied between January 1860 and August 1864 were eventually paid for in December 1865.

In 1856 Thomas Bolton took an apprentice, Stephen H. Willsher, a young man from a local family.[26] On Bolton's death in 1867, Willsher took over the business, leasing the premises from Bolton's executors. About this time a number of alterations were made inside the shop. The oak posts supporting the fifteenth century part of the building were replaced on the ground floor with the present slender iron columns. A rear extension was added, which was to house the dispensary and drug stock room for the next hundred years. The large room on the upper floor of this extension was later occupied for a few years from about 1880 by a dentist, Thomas Andrew Tait, the


T. B. Shoobridge Esqr
Bot of Stephen H. Willsher
(LATE BOLTON.)
Chemist, Druggist
Bookseller and Stationer
Agent to the Sun Fire & Life Office
To ye Rend Xmas 1868 3 8 7
Jan 9 1869 Capers 6
21 Cap White 1 6
23 Sal volatile 3

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first of three generations of Tenterden dentists.

Stephen Willsher greatly expanded the veterinary side of the business. His recipe books contain a large variety of animal medicines, drinks for yearlings, for sheep and lambs and for cows after calving. There are applications for sheep's udders, ointment for broken knees in horses, powder for scour in bullocks and in sheep, as well as an antiseptic oil for straining after lambing. He had several formulae for cordial horse balls, a dozen different horse powders, each farmer having his own favourite recipe, and several more foot-rot applications.

The formula for an arsenical sheep dip is:

"Arsenic 20 lbs.,Pearl ashes 20 lbs., Sap. Mol. a firkin, Bole Armen. two and a half lbs, Tar 20 lbs. A 4 lb. pot [of this mixture is]for 30 gallons cold water." There are two formulae for dressing a stack, one containing calomel in a paste of bre ad, lard and sugar with oils of nutmeg, rhodium and aniseed; the other reads: "Grate or break a cork into small pieces, fry it in lard. Scent with 20 drops of Oil of Rhodium (rosewood), 10 drops of Oil of Aniseed, 20 drops of Essence of Musk. Mix with 6 pots of Phosphor paste."

Willsher's big step forward, however, was the introduction of 'Willsher's Cattle Food' which he manufactured on a large scale in a neighbouring building and distributed throughout Kent and Sussex, and even further afield; a firm in Bermondsey testified to its value for their draught horses.

In 1876 Willsher wrote out an advertisement addressed "To the Visitors of the Canterbury Fat Stock Show, 1876", heading it, "Advertising is to business what Steam power is to commerce - Macaulay." He continued, " ... it is evident that for business purposes I must bring myself under your notice .... May I ask your perusal of extracts from letters of many of the best known Farmers & Graziers ...." The fifty or so testimonials from satisfied farmers are pasted into a large notebook which also contains some loose notes on the formula, and invoices from suppliers of the various ingredients.[27]

The cattle food described in the notebook as 'Thorley's recipe as Stonehenge', consisted of, "the spice", Turmeric, Liquorice, Aniseed, Coriander, Gentian, and Foenugrec, obtained [in 1877] ready mixed and ground from A.S.Hill & Son. To this was added Sulphur, Saltpetre, Cream of Tartar, Carbonate of Soda, Antimony and Salt, and a mixture of Locust Beans, Indian Corn and Linseed ground at a local windmill. A photograph of 1876 shows deliveries of the ingredients arriving on trucks drawn by a traction engine. Willsher also made use of his cattle food as a main ingredient in 'Horse Food', 'Poultry Food' (with the addition of precipitated chalk and bole) and 'Dog Meal' (with added bone meal).

For his human customers, Willsher's notebooks contain recipes for Camphor Balls, Cough, Cordial, Gripe and Cathartic Balls, Fly Powder, Plate Powder, Teething Powders, Mixed Perfume, Gonorrhoea Mixture, Toothpowder, various Shop Pills, Dalby's Carminative, Pile Electuary, Cholera Mixture, Incontinence Drops, a 'Homoeopathic' remedy for Itch (Kali Iodide 2 drachms, Aqua 16 fluid ounces - one drachm twice a day). He had a sulphur lotion copied from the *Chemist and Druggist* of May 1861 with the note: "Since using, the Military Hospitals of Portsmouth have no need of itch wards."

There is also a recipe for Kentish Relish consisting of :"Anchovies 12, Cochineal half a fluid ounce, Chillies one ounce [apoth], Garlic 2 roots, Shallots 4 roots, Soy apoth. oz.vi, Walnut Ketchup fl.oz. vi, Vinegar ad pottle bottle" [half gallon]. Directions for making a cyanide jar for killing butterflies are given, which proved useful a hundred years later in July 1964, when two such jars were made for a local entomolgist to kill moths.

From the bookshop Willsher published *Willsher's Almanac*, later taken over by a local printer as *Thomson's Almanac*, which included items of local interest together with a comprehensive price list of all the items stocked in the pharmacy.

Willsher was a member of the Tenterden Volunteer Fire Brigade, and when he was nominated in 1882 by the men as Captain, he immediately applied to the Corporation for an additional hose and for repairs of the 'old engine' [a manual pump]; in 1895 he wrote to the Town Clerk that it was absolutely necessary to have a water supply for fire purposes. In the following year, he retired from the Fire brigade and was soon succeeded in the pharmacy by Alexander Ridley, Ph.C.,and optician, a Freeman of the Spectacle Makers Company.

He developed further the non-pharmaceutical side of the business, first leasing and then in 1910 obtaining the freehold of the western half of the original fifteenth century structure, now No.62 High Street, and expanding the stock of general goods under the name of The Pharmacy Stores.His name appears on the distinctive red bull's eye pharmacy lantern above the door, the last of several such lanterns which formerly supplemented Tenterden's gas street lighting. In 1912 Ridley purchased the freehold of the rest of the pharmacy and bookshop premises.[28]

Willsher had described himself as 'Chymist & Druggist, Bookseller and Stationer', and Ridley added pottery, glassware, leather-goods, fountain pens, artists' materials and photographic goods. Photographers had been obtaining chemicals from the local chemist's shop since the 1850s, but in 1906 Ridley built a professional photographer's studio

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Tenterden High Street in 1860 showing the pharmacy

and dark room in part of the garden behind No. 62.[29]

This studio had a large north window in the corrugated iron roof and was fitted with scenery on rollers with the obligatory aspidistra on a stand. Here the local gentry and celebrities, such as Ellen Terry from nearby Smallhythe, came for their portraits. Ridley had been taking photographs of the building and scenery of Tenterden and much of the Kent and Sussex Weald since his arrival. Some of his plates and trial prints for the postcards and albums which he published have survived the clearances of the 1950s.[30]

In 1762 the Chevalier de Coetlogon, possibly a Huguenot, who styled himself 'Knight of St.Lazare, M.D.' and 'Member of the Royal Academy of Angers' who was the author of *An Universal History of the Arts & Sciences* was carrying on a general druggist's business in the village of Hothfield near Ashford.[31] A painted board below the roof of his house still bears the message:

"Dr. Coetlogon's Genuine True and Original Tincture and other medicines by the King's Patents. All sorts of Grocery, Drapery and Haberdashers Goods, Optical, Philosophical and Mathematical Instruments of a new Construction, Spectacles of New Invention, Ale, Brown, Amber, Malts and Hops Wholesale and Retale 1762". [32]

The formula of the True and Original Tincture in 1764 was bought by James Haffenden, druggist of the neighbouring village of Bethersden, whose son, a chemist in Ramsgate, eventually passed it on to Alexander Ridley. [33] A twelve page brochure advertising Haffenden's Balsamic Tincture, a copy of which has survived, contains an engraving of James Haffenden with numerous testimonials to the Tincture's restorative properties from 1759 to 1925! The formula has now been lost, manufacture having apparently ceased in the 1930s or 1940s.

Ridley continued to supply the 'Cattle Food' but in steadily decreasing quantities. The 'Spice' was supplied in 1892 by Thomas Hodgkinson, Prestons & King of Bishopsgate Street Without, but by 1904 Ridley was getting it from Davy, Hill & Co. of Southwark; in 1910 there is an invoice for only a hundredweight from British Drug Houses, an amalgamation of Hodgkinsons, Davy Hill and others. Ridley was obviously not interested in continuing to manufacture the cattle food and in May 1914 he received a letter from W.M.Crosbie & Co. Ltd. of Crayford, recommending a "Condiment made to a form we have found to give every satisfaction .... For the cost of cutting a stencil we could brand the bags with your own names and ... we should think this small expense advisable." They also suggested that "Condition Powder and Drenches are profitable lines worked with the heavier line ...."

About 1930 the pharmacy was acquired by J.J.Loughran who had another business in Brighton, so it was managed for him by Donald Thomas Crook Murray. After Ridley's death in 1943, Murray purchased the premises from the executors and

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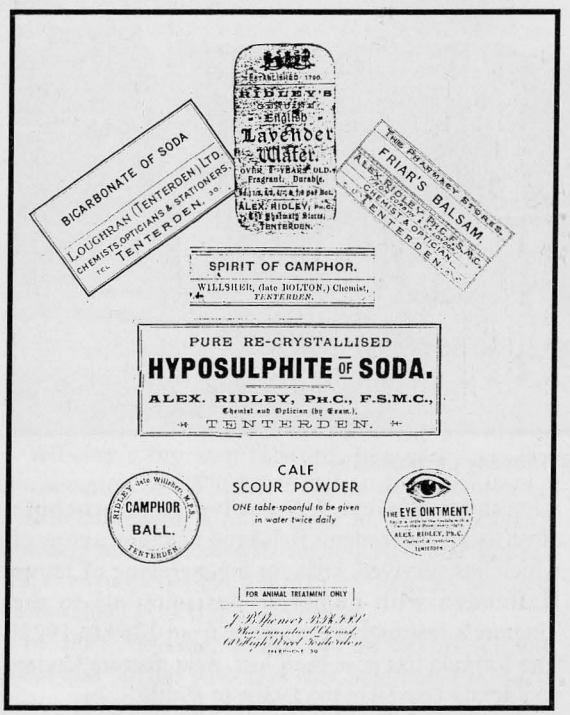
in 1954 by Mrs J.B. ('Jo') Spencer, Ph.C., F.P.S., and her biologist husband. Murray was an amateur taxidermist and a few of his specimen birds and animals were found in the roof space in 1962 having escaped the general clearance of the 1950s together with some of Ridley's photographic plates, Willsher's prescription book of 1847 to 1852, and the various recipe books of William Maylam, Thomas Bolton, Willsher and Radley.



One item which spanned a century was Willsher's 'Hemsted Bouquet', know in Ridley's time as 'Tenterden and Weald Bouquet' and later as 'Murray's Tenterden Bouquet'. A small stoneware souvenir bottle of the last survives with label designs for the other two.[36] An attractive formula for 'Bouquet de la Reine' in Willsher's notebook of about 1860 may be the prototype for this popular item.

Mrs Spencer was a very professional pharmacist, a truly pharmaceutical chemist, but also a community pharmacist in the full sense, highly regarded by the local doctors, veterinary surgeons and farmers, and very popular in the town. As a community pharmacist (before that description had been coined) she took pride in the wide range of interests catered for in retail pharmacy.Medicines and surgical came first but it was only after the introduction of the N.H.S. that the dispensing of doctors' prescriptions overtook 'counter prescribing' and the sale of 'own lines'.

The early photographers had obtained their supplies of pure chemicals from the chemist's shop, but this was now superseded by the need for expert advice on films and cameras. Cosmetics, perfumery and animal medicines had all been made on these premises in the nineteenth century, the pharmacist's advice on the modern versions and their proper use was still sought and respected.

Mrs Spencer had a particular interest in amateur theatricals, and saved the local Operatic and Dramatic Society much expense by making items of stage make-up such as wet white, blending powder, liquid make-up, and on one occasion, white lipstick for the Black and White Minstrels. She also advised on the fire-proofing of stage curtains and helped with making and repairing costumes. Under the influence of Ridley and Murray the emphasis in the bookshop had been chiefly on stationery, gifts and newspapers, and Mrs Spencer added a knowledgeable interest in the supply of artists' materials.

In her time, there was a large table in the centre of the dispensary on which there was invariably a large teapot for the sustenance of the staff and anyone who might drop in for a chat.

The business and the premises in 1962 were purchased by Hugh Roberts. For 25 years he had been in Westminster where he had inherited from his father, Stanley Vincent Roberts, the pharmacy known by the previous owner's name of 'W.F.Gulliver' at 6, Lower Belgrave Street. The bookshop was now re-organised by Mrs Roberts, she discontinuing the sale of newspapers and gifts and increasing the range and quality of the stock of books - with such success that other bookshops were attracted to the town, to the benefit of all.

At the same time the dispensary was modernised and the excellent relationship maintained with the local doctors. Mr Roberts found an extra interest in veterinary and animal pharmacy which,naturally, had been absent in Lower Belgrave Street Harry Benbow in 1965 joined the staff, his family connection with veterinary manufacturing being of great help in expanding that side of the business particularly in sheep, dairy and poultry products, agricultural chemicals, and also in veterinary instruments and stock breeders' equipment.

On Hugh Roberts' retirement in 1970, the combined business of pharmacy and bookshop, was bought by Denis Pay trading as Paydens Ltd. Mr Benbow stayed on for a time as manager of the pharmacy until he too retired. The dispensary was now moved into what had been the front part of the bookshop, the books being given increased space in the area formerly occupied since the nineteenth century by the dispensary and drug storeroom.

Several of the Tenterden doctors retired during the next few years, and in 1980 the three Tenterden pharmacies discovered that the new members of the group medical practice had been dispensing for patients not on their dispensing list since October

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1979.The resulting dispute and enquiry were reported at length in the pages of the *Pharmaceutical Journal* from November 1980 to October 1981, but this unhappy episode is now a small part of the long history of this 200 year old pharmacy.

A pharmacy is much more than a dispensary. The words of Sir Joseph Swan, pharmacist, pioneer of dry plate photography and inventor of the carbon filament electric lamp, are still valid, "I do not know any form of industry that embodies so many various interests. The well educated pharmacist ... must be a man of science, and he must also be a man of business; he must possess a wide range of both special and general knowledge."[37]

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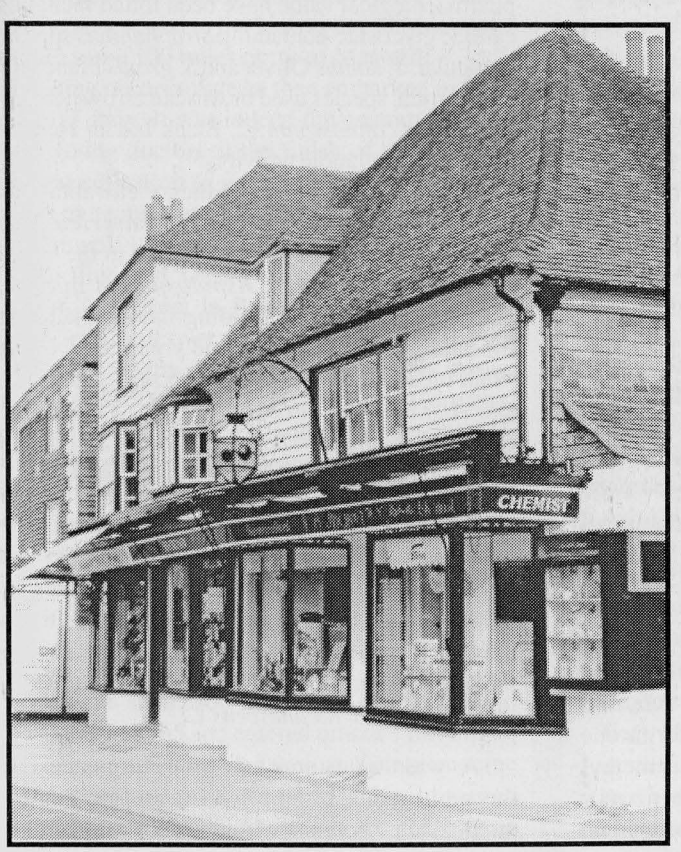
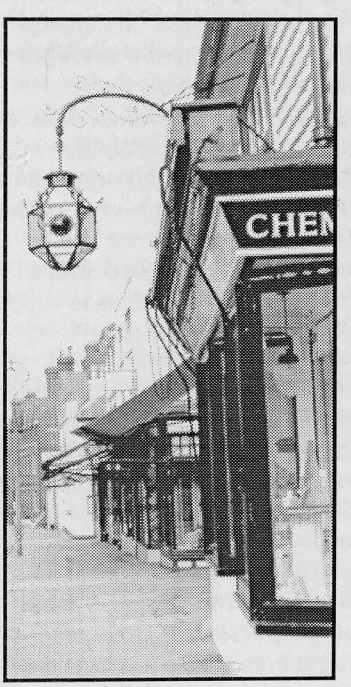


The pharmavy in 1962



Lamp dates from c.1900

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THE RAUWOLFIA STORY

Ancient Herbal Medicine - 20th Century Tranquilliser - 21st Century Reject?

William E. Court

During the first half of the 20th century medicine changed markedly consequent on the discovery of the sulphonamide drugs, a by-product of the German dye industry, and the development of the antibiotics, drugs derived from moulds as a result of the pioneering studies by Fleming and later Cheyne and Florey. Synthesis of these compounds and the preparation of derivatives and mimics ensured the success of allopathic medicine as well as the insatiable demand for synthetic cures to all sorts of illnesses. Organic chemistry had advanced a long way since the isolation and synthesis of the first organic chemical, crystalline urea, a compound found in mammalian urine, by Friedrich Wöhler (1800-1882) in 1824. But organic chemical synthesis of effective pharmaceuticals depended on inspired guesswork, expensive determined routine preparation of long series of closely related compounds or, for the lucky few, serendipity.

Plants had proved useful starting points for the production of effective medicines and for the isolation of active principles in 19th century Britain. Therefore it was not surprising that old plants were reviewed yet again in the search for tranquillisers and hypotensive agents needed for the treatment of 20th century stress-related medical conditions. After all, Valerian, the roots of *Valeriana officinalis* L. (family Valerianaceae), had proved valuable for treating shellshock during the Great War (1914-1918) and for hysteria conditions in preparations such as Mistura Potassii Bromidi et Valerianae which was still in the *National Formulary* in 1949.

The stresses and strains of modern living in the immediate post-Second World War (1939-1945) period prompted investigation of the Indian plant *Rauvolfia serpentina* Benth. This insignificant plant had stimulated so much interest in the 1940's that it was added to the 1949 *British Pharmaceutical Codex* and was retained in the subsequent 1954, 1959, 1963, 1968, 1973 and 1979 editions. The *British Pharmacopoeia* had included reserpine but not *Rauvolfia* from 1958 onwards with reference to source species *R. serpentina* Benth., *R. vomitoria* Afz. and other related species yet the 1993 edition informs one that reserpine, the most important alkaloid, is methyl 11,17α-dimethoxy-18β-(3,4,5-trimethoxybenzoyl)-3β,20α-yohimbine-16β-carboxylate but there is no mention of its *Rauvolfia origin*! Martindale's *Pharmacopoeia* (30th. ed., 1993) mentions *R.serpentina, R. tetraphylla* L. and *R. vomitoria* and the alkaloids ajmaline, ajmalicine, deserpidine, reserpiline, rescinnamine and reserpine and many combination preparations containing them. *R.serpentina* is cited in four national pharmacopoeias (Egypt, France, Germany and USA) and reserpine in 23 including the current *European* and therefore *British Pharmacopoeias.*

But what was this fascinating group of plants?

The genus *Rauvolfia* had been established in 1703 by the French-born Caribbean botanist Charles Plumier but subsequent authors e.g. Burmann, Reichard, Schreber and Willdenow used the name *Rauwolfia*. Although the spelling *Rauvolfia* was strictly correct in accordance with the provisions of the International Code of Botanical Nomenclature, there being no "w" in the Latin language, the alternative *Rauwolfia* became firmly fixed in the pharmaceutical nomenclature and held sway until the last decade. Today it is usual to encounter the correct term *Rauvolfia* when perusing research journals and botanical databases.

The genus *Rauvolfia* belongs to the dogbane family, Apocynaceae. Many Apocynaceous plants of proven pharmacological value have been found including the cardiac glycoside-containing *Strophanthus* spp. and, in particular, *S. kombé* Oliver and *S. gratus* Franchet from East Africa, species used in African arrow poisons and *Apocynum cannabinum* L., Black Indian Hemp, also possessing digitaloid activity.

Another group of dogbanes yield alkaloids. In particular *Holarrhena antidysenterica*, a bark containing conessine, has been used in the treatment of amoebic dysentery. *Aspidosperma quebracho-blanco* Schlecht. bark yielding indole alkaloids and especially aspidospermine and yohimbine, is used in tribal medicine in Argentina as a tonic and febrifuge and *Alstonia scholaris* (L.) R. Br., Dita Bark, the source of the indole alkaloid alstonine, is used for its febrifugal properties in India and the Far East.

Plumier introduced the name *Rauvolfia* in his publication *Nova Plantarum Americanarum Genera* (1703). He described two species, *Rauvolfia tetraphylla angustifolia*, which is probably the species known today as *R. nitida* Jacq., and *Rauvolfia tetraphylla latifolia*, a species now known as *R. tetraphylla* L. = *R.canescens* L.

As was the custom of the time Plumier designated the new genus by application of the name of a distinguished botanist with this dedication:

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"Leonardus Rauvolfius floruit circa annum 1583. Patriam habuit Augustam Drusi. In Orientales Regiones navigare in animum suum induxit, & anno 1573 Massiliae navim ingressus, in Orientum venit, ubi saepe cum praesentaneo vitae discrimine peragravit. Scripsit itinerarium in Syriam, quod in sex partes distinxit, in quibus plurima rara de omni medica materia observata tradit, additis variis plantarum, animalium, aliarumque rerum iconibus. Laugingae, an. 1583 in quarto".

But who was Rauwolf, this thus distinguished man honoured by Plumier when he named the genus? His name is not found in most encyclopedias and accurate information on his life is difficult to find.

According to Legré (1900) Leonhard Rauwolf was born in Augsburg, some 40 miles west of Munich in southern Germany, probably between 1535 and 1540 and, having reasonably well-to-do parents, he was able to pursue his keen interest in the then intertwined studies of botany and medicine and to proceed to the well-established prestigious school of medicine in the University of Montpellier in southern France. It is known, from extant archives, that he entered the medical school in 1560 and spent a fruitful two years of study including many successful botanising outings which enabled him to gain considerable knowledge of the abundant and varied flora of southern France. In 1562 he progressed to the University of Valence in Dauphiné, some 100 miles north of Marseille.

Obtaining his doctorate he then embarked in 1563 on a tour of Italy. It was indeed the custom in those days for young doctors at the finish of their studies and formal education to make a tour before settling down to a more mundane life. The reasonably affluent young Rauwolf was no exception to the rule but he did use his time well. During his peregrination via the centres of academia in Padua, Verona, Florence, Bologna , etc., and over the Alps to Basel, Lucerne and Zurich he avidly collected botanical specimens, acquiring some 600 samples. Returning to Germany, he arranged his herbarium specimens in three volumes, two containing French species and one presenting the Italian and Swiss specimens. This valuable collection now resides in the Rijk's Herbarium in the University of Leyden, Holland and may explain why Michael Zohary, Professor of Botany in the Jerusalem Hebrew University, in his book *Plants of the Bible* referred to Rauwolf as a pilgrim scholar from Holland.

Despite his scholastic industry, Leonhard found time to marry in 1565 and entered practice initially in Aichach near Augsburg and then at Kempten some 60 miles southwest of Augsburg. He obtained appointment as the medical officer for the city of Augsburg in 1570 and this designation appears on the title pages of his publications. He obviously maintained his medico-botanical interests in the manner of the day, arranging his collections, engaging in correspondence with other scholars and cultivating rare species in his own garden.

Plant drugs were very important commercial commodities and Rauwolf's drug merchant brother-in-law, Melchior Manlich, arranged for Leonhard to undertake a research trip to the Levant. With a companion Rauwolf set out on horseback in May, 1573 to travel an indirect route to Marseille via Milan and Nice. From the start of his journey Rauwolf kept a detailed account of his herborisings and of events during the expedition. Reaching Marseille in early June, the travellers were forced to wait three months before sailing in early September aboard the *Santa Croce*. The time was not wasted as Rauwolf carefully studied the plants indigenous to southern France.

Arriving in the Lebanese port of Tripoli late in September, Rauwolf set out on a two year journey through the Middle East, visiting the countries of the ancient cradle of civilisation including Syria, Arabia, Mesopotamia (modern Iraq) and the ancient kingdoms of Judaea, Assyria and Babylonia, areas now embedded in Israel, Jordan and Iraq. He visited the great cities of the past, Aleppo, Bir, Babylon, Baghdad, Nineveh, Joppa, Jerusalem, Sion, Bethlehem and Mount Lebanon and always he collected, preserved and recorded indigenous botanical specimens. Reaching Tripoli in November, 1575 he voyaged to Venice and then travelled overland to Augsburg arriving home in February of 1576 with his collection of over 300 plants.

He soon obtained an appointment as a physician at a local hospital in Augsburg and continued his recording of his specimens. In 1582 he was able to publish an account of his botanical travels in his native language, German, and a year later this most acceptable work was republished in an enlarged format with almost 1,500 pages and 42 woodcut illustrations. Finally the book was translated into Dutch and then into English.

In 1588 the respected physician Rauwolf was dismissed from his hospital post because he, along with many others, refused to give up membership of the protestant reformed religion in favour of catholicism. He was quickly appointed as medical officer at Linz, Austria but, in accompanying the Austrian army into Hungary in 1596, he contracted a water-borne intestinal disease, possibly cholera or typhoid fever, and died at the siege of Hatvan, north

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west of Budapest. His medical attendant, Dr Tobie Cobber, stated that he might have survived if he had not been troubled by domestic problems. Although other authors dated Rauwolf's death as 1588 (Rendle, 1937) and 1606, Cobber's observation (1596) is most probably correct.

Rauwolf's work lived on being published in various forms, e.g. an English version of his journal of Eastern travels by John Ray (1738); a summary of 338 plants collected by Rauwolf was presented by Gronovius (1755); Las gue (1845) also published a brief version of the travels. Linnaeus in his *Genera Plantarum* (1737) and in *Species Plantarum* (1753) also honoured Rauwolf by accepting the generic name *Rauvolfia* including the 'v' spelling. Linnaeus regarded Plumier's two species as varieties of a single species but considered a Ceylonese species that resembled them as a separate genus, the species being *Ophioxylon serpentinum*. The now rejected generic name Ophioxylon means literally 'snakewood' and the specific also means 'snake-like' , indicating tribal use in the treatment of snake-bite in accordance with the old worldwide Doctrine of Signatures.

The *Rauvolfia* species have been in use in tribal medicine for a very long time but our knowledge of such use depends principally on written evidence. *Rauvolfia* plants occur in the tropical and semitropical parts of the Old and New Worlds but particularly in India, Burma, Thailand and the Far East islands, in Central and South America including the West Indies and in Africa; *R. tetraphylla= R. canescens* was introduced into northern Australia. Therefore, despite his travels, Leonhard Rauwolf probably never saw the plants that would be named in his honour and, because of the lack of written records from Africa and South America, we know little of the historical use of these plants.

Indian Rauwolfia, the roots of *Rauvolfia serpentina* Benth., has probably been used in India for 3000 years. In Sanskrit its name is *sarpagandha*, *sarpa* meaning serpent and *chandra* (Hindi) meaning moon, references to both the dubious use of the plant in the treatment of snakebite and the more effective use as a calming agent for lunacy. The earliest published account of *R. serpentina* is probably in the *Charaksamhita*, an Indian medical treatisė dating back to *ca* 1000 B.C. In tribal medicine *Rauvolfia* roots were chewed by meditating Indian holy men, teas were traditionally used to soothe restless babies and the celebrated Indian political leader, Mohandas Karamchand Gandhi (1869-1948), was reputedly a regular user of *Rauvolfia* before his great speeches to vast audiences. It was also noted that mental diseases which were common amongst the teeming masses of the underprivileged Indian population, conditions such as lunacy, disorientation and schizophrenia, were treated with *R. serpentina* root.

European interest was stimulated by the publication of Garcia de Orta's book on Hindu medicine, *Coloquios dos simples e drogas e cousas mediçinaes de India,* in 1563. In 1534 Garcia sailed with Martim Affonso de Souza, grand admiral of the Indian fleet, to Goa, some 300 miles south of Bombay. Here he became the Physico d'El Rey, the royal physician in the hospital and apparently remained there until at least 1562. Although Garcia's writing style was diffuse, his work presented a valuable source of information on contemporary Indian drugs and medicine and European scholars were fortunate because this work was translated, rearranged and annotated by the eminent French botanist Clusius (Charles de l'Ecluse, 1526-1609) in 1567.

Another important contributor to our knowledge of *Rauvolfia* was Rumphius, George Eberhard Rumpf (1627-1702), a Dutch physician in the medical-botanist tradition, who also acted as the governor of Amboina, a large island in the Moluccas group, east of Borneo. Rumpf's descriptions and figures of 715 plants of the island comprised the 7 volumes of the *Herbarium Amboinense* published between 1741 and 1755 with 696 plates. Rumpf's observations included reference to the mongoose, a plucky little weasel-like animal that ate *Rauvolfia* leaves, rested briefly, and then attacked venomous snakes; this also prompted the belief that *Rauvolfia* was a snake-bite cure. Today we know that the mongoose is probably immune to the venom of many snakes because the acetylcholine receptors at the nerve endings in mongooses and snakes are so molecularly shaped that the alpha-neurotoxins of the snake venom cannot attach in order to block acetylcholine transmission and thus paralyse the mongoose or another snake (Fuchs, 1997).

The Dutch scientists J.F. Eykman and M. Greshoff published findings concerning the the identity, indigenous usage, preliminary chemistry and possible pharmacology of *R. serpentina* in 1887 and 1890. The plants were cultivated in the botanical gardens at Buitenzorg in the Indonesian island of Java. Despite the excellence of their work, *Rauvolfia was* largely ignored until the 1940s. The work of the Indian chemists R.N. Chopra, N.N. Das and S.N. Mukherjee in 1939 opened the floodgates for a spate of research papers but the initial work was hampered badly by lack of knowledge of the chemistry of the *Rauvolfia* species.

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Attempts to confirm the indigenous usage of *Rauvolfia* were not particularly successful. There had been many reports of the roots being used in the treatment of snake and scorpion bites yet, as early as 1838, Lindley had omitted any reference to snakebite despite recording the alexipharmacal nature of *Rauvolfia,* and Waring in the 1868 *Pharmacopoeia of India* stated, "It is held in high esteem by the natives for snakebite" but added "reliable evidence of its utility is wanting". No doubt this is yet another misleading application of the Doctrine of Signatures, the wriggly appearance of the roots being solely due to the stony soil in which the shrubs grew.

Rumphius in 1755 (v.s.) had referred to the use of *Rauvolfia* against anxiety states and Rama Rao in 1914 also reported its use in the treatment of fits, epilepsy and insanity. Indian medical men explored the pharmacological and therapeutic properties of *R. serpentina* in the 1930s and 1940s and some physicians in Europe and America confirmed the therapeutic potential of *Rauvolfia* (Feuell, 1955). It was noted that *Rauvolfia* extracts in addition to the tranquillising effect also promoted reduction of high blood pressure in test animals and human subjects. Results were however variable because the crude plant extracts were inconsistent. Therefore better chemical studies were imperative.

Although an indole alkaloid incorrectly named pseudo-brucine was detected as early as 1890, no real progress occurred until 1931 when Siddiqui's Indian group tried to isolate the constituent phytochemicals in *R. serpentina.* They discovered two groups of indole alkaloids. The first group comprised three compounds, all white, weak bases, ajmaline, ajmalinine and ajmalicine, and the second group included the yellow, strong bases serpentine and serpentinine. Ajmaline was named in honour of the famous practitioner of indigenous Indian medicine, Hakim Ajmal Khan, who had founded the Ayurvedic and Unani Tibbi College in Delhi, the college in which Siddiqui's team worked.

Unfortunately these alkaloids did not fully explain the pharmacological actions of *Rauvolfia.* Chopra's team during the decade 1933-1943 shewed that the hypotensive activity of the then isolated alkaloids did not match the action of the plant root extracts. Further work was essential. Gupta et al. (1947) concluded that the resin precipitated from an alcoholic solution of the root extract using hydrochloric acid contained the active principle and the alcohol soluble fraction of the resin was specific. Despite this apparent step forward the vital principle was to remain hidden until 1952 when Müller, Schlittler and Bein, working in the Ciba Research Laboratories, isolated from the oleoresin fraction a feebly basic alkaloid that demonstrated the characteristic pharmacological activity of the total root extract. They named the compound reserpine.

Why had so many skilled research workers failed to isolate reserpine earlier? The answer resided in the extraction and separation techniques used. The conventional method was the Stas-Otto system which depended on the solution of alkaloid salts in aqueous media and alkaloid bases in chloroform. Thus total alkaloids were extracted in chloroform or methanol and the resultant solution reduced to dryness under reduced pressure. Extraction with acid produced a solution of alkaloidal salts and addition of alkali would theoretically precipitate the alkaloid bases which could then be extracted in an organic solvent e.g. chloroform. Reserpine, however, was so feebly basic that it was rejected in the chloroform washings of the acid solution. Indeed the baby had been thrown out in the bathwater!

Müller et al. had used the emerging chromatographic and liquid-liquid counter-current separation methods to achieve their success. Those of us who followed them after had learned an important lesson viz. never throw a liquid fraction or washing away until you have tested it. But we were fortunate because the newer techniques of paper, column and thin layer chromatography gave us valuable flexible tools to develop and exploit.

The isolation of reserpine, the most important phytochemical in *R. serpentina*, stimulated a tremendous demand for roots. The Indian government, anxious to conserve stocks of these valuable plants, was forced to place intermittent embargoes on the export of the roots. In 1954 the shortage caused prompted questions in the British parliament (*Hansard,* 1954, 533, 744) and also a widespread survey of plants of the genus *Rauvolfia* and related genera in the hope of finding new sources. The *Kew Index* and its supplements listed some 180 species of *Rauvolfia* but several were shewn to be synonymous and the generally accepted figure is about 80 species distributed in tropical and subtropical areas of Central and South America (ca 34 spp.), Africa (ca 17 spp.), the Indian subcontinent (ca 7 spp.), South-East Asia and the Pacific Islands (ca 30 spp.).

In 1956 my old friend and former tutor Professor George Edward Trease (1902-1986) in collaboration with Dr William Charles Evans invited me to investigate the African species *R. caffra* Sonder. That was the beginning of my work on the African *Rauvolfia species*. Over a period of some 25 years my group acquired samples of roots, stems and leaves of ten continental African species, one Thai species and

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one Central American species. Surprisingly we failed to obtain a large sample (i.e. more than 10kg) of the best known of all the *Rauvolfia* species, *Rauvolfia serpentina* Benth. from India. Herbarium samples were limited in quantity and accessibility and leaves and stems collected by reliable collectors, being of little commercial value, were difficult to acquire.

During my working life in my own laboratories in Liverpool and Bradford, England and Saskatoon, Canada, we pursued an analytical approach and to achieve our aims we concentrated on:

a) the in-house authentication of plant material that had been collected by responsible collectors in Africa; methods employed included qualitative and quantitative microscopy, thin layer chromatography and chromogenic tests;

b) the development of separation and isolation techniques based mainly on liquid/liquid separation followed by column chromatography and/or preparative layer chromatography (PLC) or thin layer chromatography (TLC);

c) improved quantitative analysis, especially TLC elution methods (Court, 1968);

d) isolation and characterisation of alkaloids from various plant parts by chromatography, ultraviolet (UV), infrared (IR), nuclear magnetic resonance (NMR) and mass (MS) spectrometry, etc..

The major problems encountered were difficulties in obtaining pure reference compounds and reliable samples of plant material in quantities exceeding 10 Kg. Limitations on access to more sophisticated modern spectroscopic apparatus also presented some difficulties.

In a series of 64 published papers we reported no less than 150 individual alkaloids from *Rauvolfia* species and satisfactorily identified 133 of these alkaloids. The alkaloids are apparently all indolic and can be classified into at least 18 groups. The occurrence of such a variety of different alkaloids has puzzled scientists and many ways have been explored in the hope of solving the riddle of the complex alkaloidal mixtures, e.g.:

1) Efforts have been made to build up the alkaloids from simple amino acids by carefully designed plant feeding experiments. In practice this is difficult as the labelled amino acids distribute throughout the complex mixtures of alkaloids in the growing plant and there is a resultant major separation problem.

2) An alternative is the organic chemical biomimetic synthesis which may be chemically elegant, yet bears no relationship to the natural processes in the plant's living environment.

3) Enzyme experiments are especially useful for indicating the probable steps in the natural synthetic process, but it must be confirmed that the required enzymes do actually occur in the plant.

4) Tissue and cell suspension cultures of *Rauvolfia* species have proved useful vehicles for the study of biosynthesis of the indole alkaloids. Although tissue callus cultures produced some alkaloids, the growth rate was slow (ca 55 days) and the yield low. Cell suspension cultures of *Rauvolfia serpentina*, on the other hand, produced a wider range of more alkaloids in greater yield and in shorter time, enabling enzyme studies to be undertaken (Stöckigt, 1996). It is important to stress that these systems do not exactly parallel the production of alkaloids in the living vegetative plant; thus many workers have failed to isolate reserpine from such cultures despite the fact that reserpine apparently occurs in the roots of all known living *Rauvolfia* species. Ajmaline, on the other hand, can be obtained in abundance from cell cultures.

5) A further stratagem is the careful analysis of plant material in order to isolate the compounds present and then the philosophical piecing together of the jigsaw puzzle of compounds in the light of current knowledge.

Realising our laboratory limitations we chose the last named method and our work required :-

Exhaustive initial literature survey;
Careful authentication of plant materials;
Efficient extraction methods;
Honest identification of the resultant compounds;
Meticulous on-going literature surveys;
Philosophical thought and interpretation of the accumulated evidence.

This pattern can be applied to any other pharmacognostical problem and will probably prove equally rewarding.

We were busy following our track, but what was happening to the *Rauvolfia* alkaloids in medical practice? At first reserpine was widely used for the treatment of hypertension and psychiatric conditions such as schizophrenia. It was valued because patients with chronic mental illness usually became relaxed, sociable and cooperative. Unlike the synthetic barbiturates it tranquillised rather than hypnotised. Indeed in 1965 reserpine was highly praised for its role in the treatment, but not cure, of institutionalised schizophrenia patients and was considered the most valuable tranquillizing or antipsychotic drug obtained from plants. Reserpine was also used to counter stress and so encourage growth of poultry and to permit unstressed transportation of turkeys.

However there were problems ahead. The use of

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larger and larger doses of reserpine revealed worrying side effects, especially marked reduction in blood pressure, manic depression and gastric disturbance in some patients; special precautions were needed in cases of ECT, ulcerative colitis, cardiac impairment, asthma and bronchitis. As has happened with some other drugs, adverse publicity and the availability of the alternative antihypertensive, methyldopa (3,4-dihydroxy-phenylalanine), Aldomet, Dopamet, Hydromet, Medomet), ensured decline in the use of the reserpine preparations in Britain.

Methyldopa had one great advantage; unlike reserpine it could be easily synthesised. Although reserpine had been synthesised by Dr Robert B. Woodward of Harvard in 1956, the process was complex, multistage and not commercially viable. By 1980 use of reserpine had almost ceased although monographs on *R. serpentina, R. vomitoria* Afz. and reserpine appeared in the 1979 *British Pharmaceutical Codex*. Today no reference to Rauvolfia alkaloids can be found in the *Monthly Index of Medical Specialities* (MIMS).

Ajmaline, which occurs abundantly in most *Rauvolfia* species, can be used as an alternative to digitalis or quinidine therapy and was so-used in Continental Europe and Japan, but it has not been used in British practice. It is also now practicable to produce very large quantities of ajmaline by tissue culture methods although, apart from reserpine, other *Rauvolfia* alkaloids cannot, as yet, be easily so produced. Related alkaloids such as ajmalicine, deserpidine, rescinnamine and reserpiline failed to achieve medicinal usage.

Therefore, what are the future prospects? Despite the insistence of some consultants that reserpine was and is a very effective means of reducing hypertension rapidly, and despite its continuing use in pharmacological research and the effectiveness of the total alkaloid mixture, the newer allopathic medicines have, at least for the present, pushed *Rauvolfia* back into the fields of botanical research and medical history. Nevertheless the contribution of *Rauvolfia* research to the botany of the Apocynaceae, to the development of greater understanding of indole alkaloid chemistry, to the invention of newer methods of chemical separation and analysis, and to greater comprehension of mental processes and the management of psychiatric patients can never be forgotten.

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I am most grateful for the accumulated work and co-operation of my research colleagues:- B.A. Akinloye (decd.), M.M. Amer, Warank Boonchuay, W.C. Evans, M.S. Habib, Fayha S. Hakim, M.J. Harris, M.M. Iwu, Afaf A. Khalil, W.Christine Los, A.M.A.G. Nasser, Janet M. Peck (decd.), Nawal N. Sabri, A.F. Stewart, P. Timmins and G.E. Trease (decd.).

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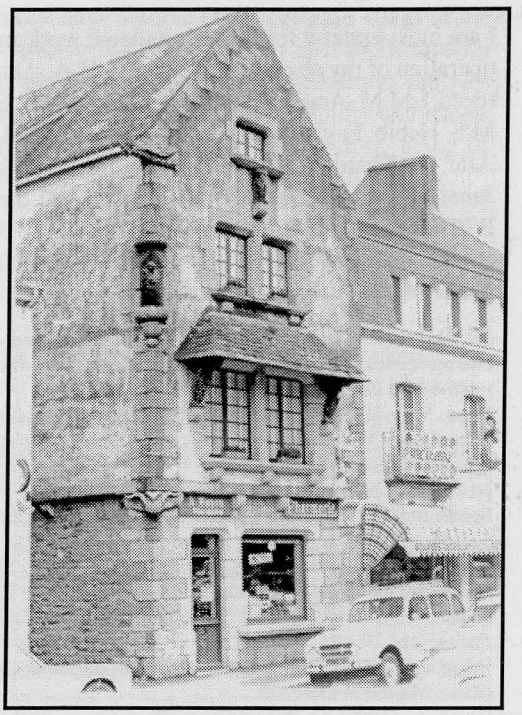
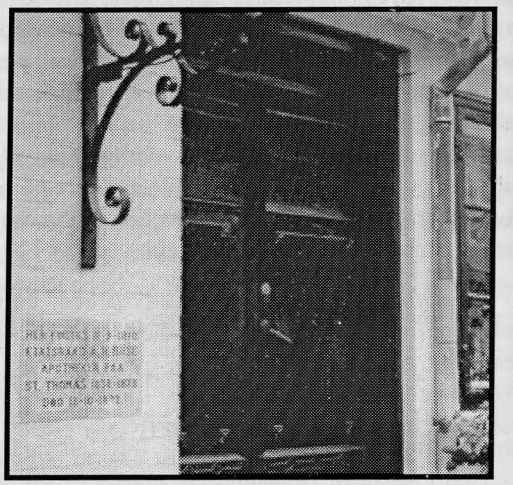
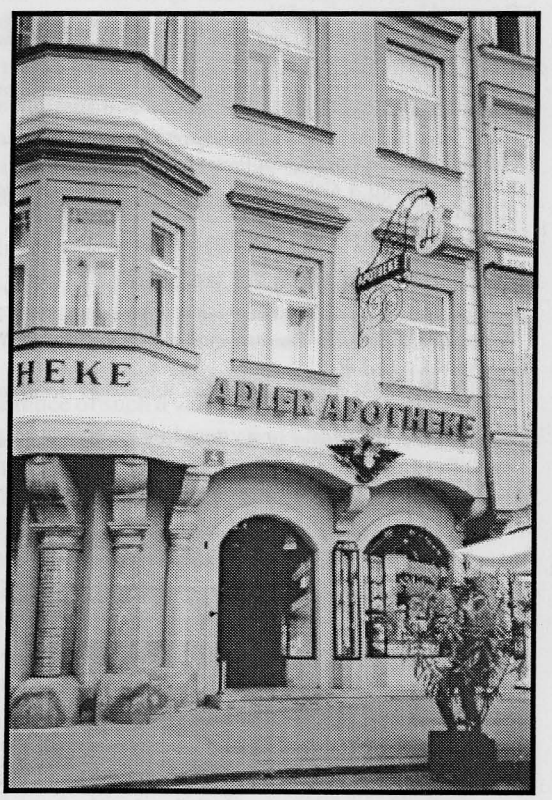


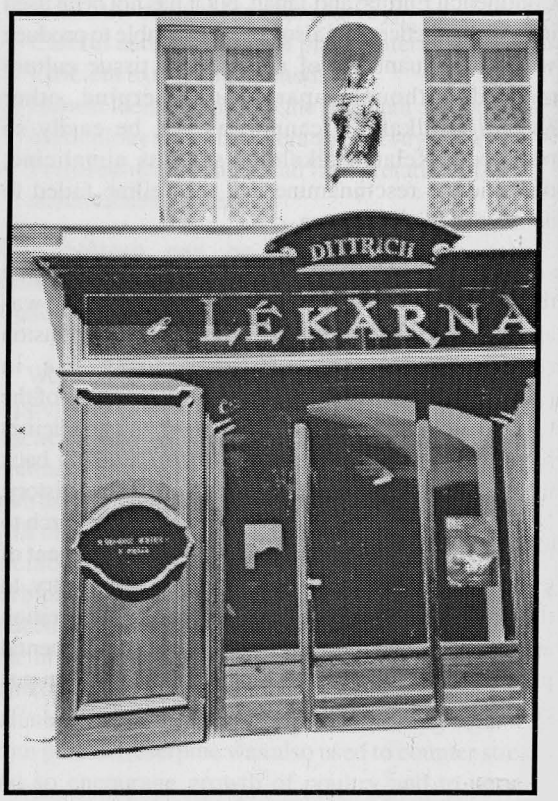
Pharmacy at Pont-Aven, Brittany.
N.B. Statues and gargoyles



Some pharmacists rise in The World ! Notice reads, "Here was born 11-9-1810, Councillor of State A.H.Riise, pharmacist on St. Thomas [West Indies], 1838-1878. Died 18-10-1882."
Aerokobing, Denmark. June 1992



The Adler Pharmacy in Graz, Austria. - June 1993



Pharmacy, (Lekarna) in Nerudova, Mala Strana, Prague. Now a pharmacy museum. - June 1993

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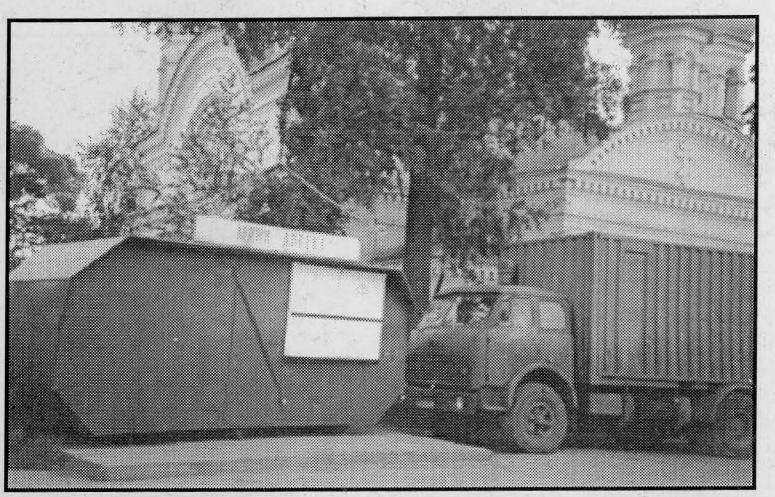
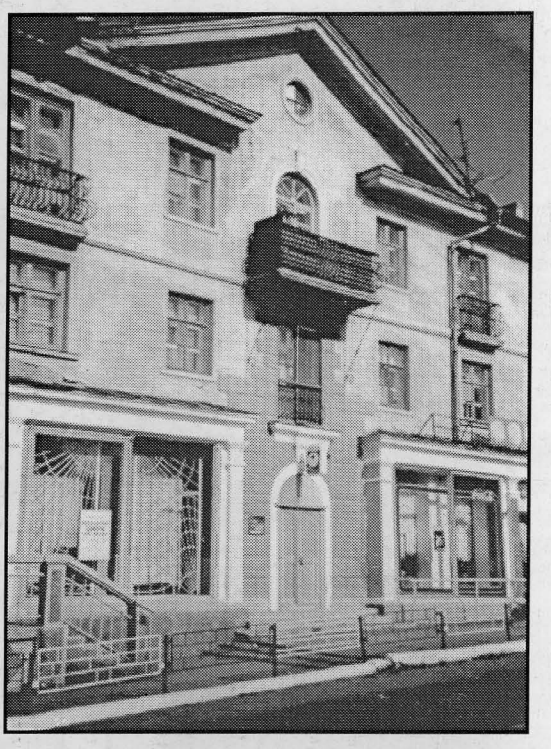


Pharmacy in Vilkovo, Ukraine. 18th July 1998. Very obviously closed !

Close-up of notice which seems to give the hours when open.



Pharmacy in Ismail, Ukraine. 18th. July 1998: - a Saturday morning: The Pharmacy was closed and on peering through the windows, the shelves looked very empty.

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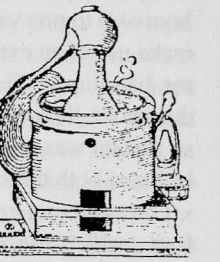

Editor: Dr. J. Burnby, B.Pharm., Ph.D., FRPharmS., FSA.
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Change of Address.

As a consequence of reorganisation within the Royal Pharmaceutical Society, the administrative support which is kindly provided to the British Society for the History of Pharmacy will in the New Year be based at Lambeth. As a result communications should be sent to:
The Secretary,
British Society for the History of Pharmacy,
1, Lambeth High Street, London. SE1 7JN.
Tel. 0171-735-9141.
We would like to take this opportunity of expressing our thanks to all Edinburgh based staff of the Royal Pharmaceutical Society who have provided support to our Society over many years past. Their services have been much appreciated by all concerned.

Pack up your Medicines.
Readers having difficulty in obtaining copies of Mr Victor Hammond's book, reviewed in our last issue, are advised that the publication may be ordered direct from the author and publisher:
Mr C.V.Hammond, Purnvic Books, 10, Wentworth, 27, Westcliffe Road, Birkdale, Southport. PR8 2BL.

Cost: £26.50 + p.& p. £2.50 (UK), £4.50 (EU), £6.50 other destinations.

Diary Dates.

Wednesday, 17 February 1999.
"Pharmaceutical Treasures at the Science Museum."
Blythe House, Kensington, London.

Wednesday, 17 March 1999.
Foundation Lecture, " Susannah Avery, her book".
by Dr. David Avery.

Spring Conference. 16th to 18th April 1999.
This will be held at the Grosvenor Hotel,
Stratford-on-Avon

The Editor and Serendipity.

Surely nobody can deny that sheer luck does not sometimes enter into historical research, such as finding the right document at just the right moment. Certainly I've had my fair share of it and we would like to hear about yours.

Cupping.

On 29 March 1847 Dr Jonathan Pereira wrote to Jacob Bell, "Some years ago the London Hospital had a professed cupper (Mr Atkinson Jun.) and paid him I think a salary of £50 per annum. But it occurred to me that the whole might be saved, & at my suggestion the following plan was adopted. We have two dispensers, one at a salary of £60, the other at £50 per annum. Now we make it a *sine qua non,* that the first dispenser shall be qualified as cupper & electrician & he has the charge of the apparatus & cases, he is called Cupper, Electrician & first or principal Dispenser. The plan answers with us admirably. We have now two capital & steady dispensers, & the first is a good cupper & electrician"[1]

This man was in charge of the vacuum cups placed on the skin as a means of blood-letting and the apparatus used for therapeutic galvanism then in vogue.

It seems that others were always keen to find work for pharmacists which certainly could not be regarded as pharmaceutical!

Cupping is a device which has been known for centuries and in many countries as I realised after reading *A Voyage to Abyssinia* by Father Jerome Lobo.[2] He was born in Lisbon in 1593 and entered the Jesuit Order at the age of sixteen. When he was 28 he was sent to India and two or three years later told to go to Abyssinia to convert the people to orthodox Catholicism. He was there nine years during which time he was subjected to many dangers.

Once he was bitten by a snake so that his arm became greatly inflamed and he began to convulse. He tried bezoar which he claimed had been helpful

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before, but on this occasion was useless, then unicorn horn also to no avail. Then, "I found myself obliged to make use of an extraordinary remedy" which "brought the blessing of Heaven upon me." Unfortunately he does not tell us what it was. His health continued poor so that he was obliged to take cloves of garlic though he hated both the smell and taste.

On another occasion he found trees laden with fruit which the natives called **anchoy** resembling an apricot which was much eaten. He therefore gathered and ate them without knowing that the locals always peeled them, the rind being a violent purgative, "... so that eating the fruit and skin together, I fell into such a disorder as almost brought me to my end. The ordinary dose is six of these rinds, and I had devoured twenty."

On the way to Abyssinia, "somewhere near the kingdom of Jubo" which was tributary to the Portuguese, he developed a violent fever which threatened his life. "I resolved to let myself blood, though I was a stranger to the manner of doing it and had no lancet." His companions however heard of a 'surgeon' of reputation and fetched him.

"I saw, with the utmost surprise, an old Moor enter my chamber with a kind of small dagger, all over rusty, and a mallet in his hand and three cups of horn about a foot long. I started and asked what he wanted. He told me, to bleed me.

"When I had given him leave, uncovering my side, he applied one of his horn cups which he stopped with chewed paper and by that means made it stick fast; in the same manner he fixed on the other two, and fell to sharpening his instrument assuring me that he would give me no pain. He then took off his cups and gave in each place a stroke with his poignard which was followed by a stream of blood. He applied his cups several times and every time struck his lancet into the same place. Having drawn away a large quantity of blood, he sealed the orifices with three lumps of tallow."

Lobo's sole comment was, "I know not whether to attribute my cure to bleeding or my fear but I had from that time no return of my fever."

The method employed was not just that intended by Jonathan Pereira, but was nevertheless successful.

Salep and 'Saloop'.

Sitting on a seat close to the busy quay of Istanbul, idly watching the crowds go by, I noticed a kiosk which sold cups of tea and coffee, and something known as 'salep'. Somewhere I had read about salep, but of course could not recollect just where. Then by one of those happy coincidences I found amongst my piles of papers the *Pharmaceutical Journal* of 14 April 1956 (p.176) which relates that Salep is almost unknown in British pharmacy but that at the time of writing it was included in the pharmacopoeias of at least thirteen other European countries. Salep is derived from plants of the Orchidaceae family of which *Orchis mascula* or Early Purple Orchis was the most highly prized. It had been known to Dioscorides and the Arabs, and in the Middle Ages had been used in Britain.

Its value appears to be almost entirely due to the mucilage content which was demulcent and nutritous. Perhaps the Turks drink it in order to withstand the rigours of the mad rush hour!

Then another piece of luck came my way, a friend sent the photocopy of an article by R.M.Healey entitled "Some notes on Saloop". Charles Lamb had written of a drink much favoured by chimney sweeps called 'saloop', which appears however to be a decoction of sassafras to which milk and sugar could be added.

On the other hand J.T.Smith in his *Cries of London* (1839) quotes from Charles Bryant's *Dioetetica* (1783) which quite definitely says that 'saloop' is salep and that it came from Turkey where it was a "celebrated restorative". Bryant Lillywhite writes that a popular saloop-house had been opened in 1719 by somebody called Lockyer who had made a small fortune from the drink at the time of his death in 1739.[3]

The pharmaceutical historian promptly begins to wonder if he were a relative of Lionel Lockyer of Lockyer's Pill fame.

Healey makes the suggestion that Lockyer and his successor Read began to serve 'saloop' made from salep powder in water and flavoured with sassafras as the drink is so insipid. Then a steep rise in the price of salep in the 1740s suggested the use of sassafras pith which also forms with water a demulcent mucilage.

In case any readers care to experiment here are two formulae from the *Chemist and Druggist's Pharmaceutical Formulas*, 11th.edn.,1944, vol. I, p.414:

Mucilago Salep. NF.

Powdered Salep	grs. 45
Cold Water	fl. ozs 3
Boiling Water	fl. ozs. 29

Mucilago Sassafras. USP, NF, BPC.

Sassafras Pith	Apoth. oz. i
Distilled Water	Pints iiss.

Macerate for 3 hours and strain without expression.

British Oil.

Betton's British Oil was patented in 1742 but its history is not so simple or so unchequered as is thought.The first patented medicine seems to have been that of Patrick Anderson's successor, Thomas

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Weir, granted letters patent in 1687 for his Scots Pills and confirmatory Letters of Certification in 1694.The next is that of Nehemiah Grew, MD, FRS, for Epsom Salts in 1695, followed by Timothy Byfield's Sal Oleosum Volatile in 1711 and Stoughton's Cordial Elixir the year afterwards.

This may be wrong however!

The Darbys of Coalbrookdale are famous in the metallurgical world for being the first to use coal for smelting iron. Less well known is that they have a connection with 'patent' medicines. Abraham Darby II's brother, Edmund (1712-1756), did not enter the iron works but called upon customers and journeyed to fairs. There, he sold some of the products of the works in which he had a small share, such as pots and kettles, but also groceries, candles, soap, hops, tobacco, fish and Jamaica rum.[4]

At one time a frequent visitor to Coalbrookdale, I bought the little booklet *The Tar Tunnel* which says that traces of bitumen were widely observed in Shropshire. "Bitumen bearing rock on the banks of the Row Brook at Pitchford was worked in the 1690s by Martin Eele of Broseley, who also extracted pitch at Jackfield in the Severn Gorge. In 1745 the Pitchford workings were leased to Thomas Betton who three years previously with Michael Betton, 'gentlemen of Shrewsbury', had patented "An Oyl extracted from flinty rock for the cure of Rheumatick and Scorbutick [diseases] and other cases." The letters patent, granted on 14 August 1742, contained a proviso obliging them to give a description of the nature of the invention to be enrolled in the Court of Chancery within three calendar months.

The specification (1742 - No.587) explained that the oil was made from "the Black pitchy flinty rock which is commonly found lying next and immediately over the coal in coal mines" which was pounded with hammers into powder, and then put in a furnace which melted the oil from it. "This was "Betton's British Oil" which traditionally was also made from some of the bitumen of the Tar Tunnel."[6]

The next bit of serendipty was a friend looking through the *London Gazette* (No.8514) who found the following interesting piece of information:

"At the Court of St. James, 27 February 1745/46."

"Present - the King's most Excellent Majesty in Council."

"Whereas His Majesty was pleased, by his letters patent bearing the date 14th August in the 16th. year of his reign, to grant unto Michael BETTON and Thomas BETTON the sole power and privilege of making, vending a certain Oyl by them invented, commonly called British Oyl for the term of fourteen years: in which Letters Patent it was provided amongst other things that if at any time ... it should be made to appear to His Majesty, or to any six or more of his Privy Council, ... that the said invention was not a new invention ... or not invented by the said Michael BETTON or Thomas BETTON, then upon signification or declaration thereof ... the said Letters Patent should utterly cease and become void.

And whereas Edmund DARBY and Samuel BODEN of Colebrookdale [sic] Co. Salop, makers and dealers in an oyl, commonly called the British Oyl, have in their petition lately presented to His Majesty in council prayed that the Letters Patent ... might be vacated in regard the said invention is not a new invention, a patent having been granted by King William III in the year 1693 for the term of fourteern years to Martin EELE and two others at his nomination, for making the same sort of oyl from the same sort of materials with which the said Michael Betton and Thomas Betton make their oyl ...."

The petition and the patent were referred to the Privy Council who in their turn referred it to the Attorney and Solicitor General. Many affidavits on both sides were examined and they had come to the conclusion that the Bettons were not the first and sole inventors of the oil, nor was it a new invention, so that the Letters patent should be made void. And this was accordingly done on 27 February 1745/6.

The Bettons however continued to advertise their oil with great success, but that of Edmund Darby, is unknown - which shows the power of advertising. Darby died in 1756 after being thrown from his horse when returning from Abingdon Fair.

Notes and References.

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Pharmaceutical Wholesale Distribution in the United Kingdom, 1950-1990

Dr P.M.Worling.

Pharmaceutical wholesale distribution in 1950 showed little difference from the service operating before the war. Retail pharmacies were given a reasonable delivery service from their local wholesaler who supplied their drugs and galenicals in the size ordered, and usually offered a 'specials' manufacturing service making small quantities of the more awkward prescripions. The delivery frequency was daily within the town area, but in the country districts twice or three times weekly. Orders were largely for bulk supplies of items for use in prescriptions made up extemporaneously, but also included tablets, capsules, ointments and sundries.

The fine chemicals industry

The British based fine chemicals industry received a considerable stimulus in the 1914-18 war with the need to replace many chemicals previously imported from Europe. Growth continued afterwards and received a further boost in 1938 when the Medical Research Council produced a list of medical products which were essential. Plans were drawn up to manufacture them in sufficient quantity, including those covered by foreign patents. This pre-planning enabled production to be started quickly so that the shortages of the first war were avoided.

Manufacturers were directed to serve the war effort and raw materials were only available for essential production. Despite this and the period of control up to 1950 remarkable advances were made in the development of new processes and products. These included production of the sulphonamides, and large scale manufacture of penicillin and other antibiotics. There was a growing range of new drugs, particularly those that had a specific action. This accelerated the growth of packed 'ethical' pharmaceuticals and lessened the demand for multi-ingredient dispensed medicines.

The effect of the National Health Service on retail pharmacy.

After the introduction of the NHS doctors largely ceased supplying medicines except in rural areas which resulted in a significant increase in the demand for prescriptions. Most pharmacists confirmed that there was an increase in the volume of dispensing, more 'ethicals' were prescribed, larger quantities were demanded and costs moved upwards. There was a gradual, although temporary, drop in sales for over-the-counter medicines as patients now went to the medical practitioner for treatment instead of the pharmacist.

Most wholesalers benefitted from this increase in business and saw a steady rise in turnover, but one small group was adversely affected. They were the wholesalers who had specialised in preparing and supplying doctors with concentrated mixtures for use in 'doctor dispensing'. This business reduced considerably.

The level of increased business was shown by the figures for prescriptions. These increased to 187 million in 1948, 219 in 1949, reaching 250 in 1956. A pharmacist writing to the *Chemist and Druggist* believed a pharmacist could now, at last, live from the proceeds of dispensing and the sale of O-T-C medicines; toiletries and cosmetics would be the jam.

The effect on the wholesalers.

The immediate effect was a growing demand for standard drugs and preparations used in dispensing.At first the range of 'ethical' proprietaries was small and the greater part of the wholesalers' warehouses was devoted to the storage and packing of 'wets' and 'drys'. These continued to be packed into retail quantities from bulk; the greatest demand was for ointments and mixtures. The major wholesalers also still offered a 'specials' service which continued up to 1968 when the additional restrictions introduced by the Medicines Act 1968 made it uneconomical except on a manufacturing scale.

The shortages and rationing during the war and immediate post-war years meant that there had been no investment in vans or new equipment and most wholesalers were operating out of old multi-storey warehouses with high labour costs.

The wholesale service then fell into two types.There were those who concentrated on the supply of 'patent', much advertised medicines and sundries, covered a large geographical area and whose orders were received by post and telegraph. They also employed commercial travellers on regular journeys to check retailers' stocks and send in orders. Van journeys covered the area close to the warehouse, while customers at a distance were supplied by rail and carrier.

The second group was the comprehensive pharmaceutical wholesaler. They stocked a wide range of drugs and galenicals, ointments and tablets together with medical sundries. Orders were received by post and telephone, and most were dealt with on the day received. Delivery was same day in the town or the next day depending on the frequency of the van journeys; beyond a radius of fifteeen or twenty miles delivery was usually three times a week.

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It was during 1950 to 1960 that the 'ethical' pharmaceutical service was established, growing from the local wholesalers' service; initially the changes developed slowly. There continued to be many orders for standard drugs and galenicals. Retailers held a comprehensive stock of items in local demand and could meet most prescriptions for mixtures, ointments, powders and tablets, and were accustomed to those of their local practitioners, often based on standard formulae or local hospital formularies.

With the growth in the number and complexity of 'ethical' proprietaries the position changed. The pharmacist found it difficult to keep in stock every item prescribed, many were copies of other manufacturers' products and it became impossible to stock every variant. There was also a growing number of new products, until a point was reached where funding the stock became a problem.

Purchasing from the wholesaler had a number of advantages. Manufacturing companies kept the wholesaler informed of the introduction of new products and made sure he had stocks before their medical representatives visited the general practioners. The wholesaler covered a wide area, thus he could carry comprehensive stocks because an item not in demand in one area was needed in another. Selling prices were fixed so that even slow moving items could be handled at a profit. The retailer depended on the wholesaler to supply promptly in small quantities and give him a period of credit which could stretch up to four months.

Wholesalers were not long to realise that this new 'ethical' prescription business was profitable. At the recommended price to the retailer, they received a discount of 15%, the goods were easily handled in small valuable packages, the cost of handling was less than that of buying drugs in bulk and re-packing by hand for a comparitively low selling price per pack. An increase in turnover was reflected directly in an increase in profit. Wholesalers expanded their business by extending their territory and improving service.

Macarthy's (Wholesale Chemists) Ltd. of Romford are credited with introducing the first fast 'ethical' delivery service by offering a twice-daily delivery with more frequent ones in the town centre. The wholesaler telephoned for the order so that the retailer had no call charges, and because smaller vans were used so making delivery frequency more flexible, it was increased to twice a day in the country. The company opened new branches, this competitive pressure soon leading to all wholesalers offering a twice daily 'ethical' service.

Operational problems.

The rapid increase in the volume of business coupled with the expanding product range began to strain the wholesalers' operating systems. Orders were still assembled by hand in multi-storey buildings with different departments on different floors. Orders were handwritten, postal orders, or if taken by telephone, were usually typed. Fortunately, systems developed quickly to improve the handling of orders, such as continuous stationery which enabled multi-part sets to be produced with separate copies for each department, a delivery note and a pricing copy.

Hand pricing from the manufacturers' price lists was a laborious, slow process. Wholesalers became so far behind that customers had the windfall of extra credit as the invoices were late. This was eased with the introduction of punched card systems, a separate card for each item carrying information on size and price. A card was collected from the shelf for each product and a priced invoice could be prepared from the details on it. The final solution was the introduction of computer systems with the big advantage that the order could be printed in the order of assembly, so speeding up order -processing, and then priced immediately. These were the forerunners of today's efficient automatic order assembly and processing techniques.

By the early 1960s the fast 'ethical' service was well established, a chain of wholesalers the length and breadth of the country offering a comprehensive service. Competitive pressure forced them to expand their available products so that they could offer the full range of ethicals, drugs, sundries and proprietary medicines.

Some manufacturers were initially reluctant to expand their 'ethical' franchise distribution to all and sundry, but eventually the old loyalties were set aside, **all** products being made available to **all** wholesalers.

Resale price maintenance.

In some respects the position was too good to last. Wholesalers were selling at fixed prices with an acceptable level of discount. Competition was through the level of service, so favouring the local wholesaler who could offer a frequent delivery and build his business on local loyalties. There was a lobby against the fixing of prices and the Restrictive Practices Act of 1956 made collective agreements to control prices unlawful. Manufacturers retained however the right to maintain prices individually for their range of products and this enhanced the position of the Proprietary Articles Trade Association, as they were permitted to act on behalf of manufacturers against price cutters, provided this was on an individual basis

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and not in concert. The Act had little influence on the pharmaceutical market. 'Ethicals' used in dispensing were paid for by the N.H.S. and wholesalers had no reason to supply at other than the list price. Proprietary medicines sold in the pharmacy continued to be largely sold at maintained prices fixed by the manufacturers.

In 1964 the Government introduced a Bill to end R.P.M., the Act coming into force in July. This made it unlawful to publish or enforce a minimum selling price.There was an option to register the practice and to defend this in the courts; three trade associations, the P.A.T.A., A.B.P.I. and N.A.P.D. decided to follow this course and defend the continuation of price maintenance on medicines. The hearing started in April 1970 and a judgement in favour was delivered on 5th.June. The case was won on the need to maintain prices in order to ensure that the public was not disadvantaged by a reduction in the choice of products available, or a reduction in the number of pharmacies resulting from price discounting.

This gave a breathing space, but the flaw was that the judgement applied only to medicines, not to other over-the-counter items sold in pharmacies. Retail competition continued to grow, particularly with grocery, and some pharmacy, chains prepared to discount items traditionally stocked by pharmacies such as toiletries, sundries and paper products. Pharmacists lost business which led to a number of proposals on how they could become more competitive. The then National Pharmaceutical Union (N.P.U.) introduced a range of pharmacy-only 'own label' products to be sold through franchised wholesalers, but this was not successful.

The American experience with 'voluntary trading' organisations, where the retailer joined with a wholesaler to promote a specified range of products at discounted prices each month, was taken as a possible model. Sangers, a major wholesaler, introduced a scheme in 1973. Towards the end of that year the N.P.U. re-launched their scheme, calling it 'Care Chemists'. The Pharmaceutical Society objected to this title as it implied an invidious distinction between pharmacies. The matter was brought before the Statutory Committee in 1974 and resulted in the title being changed to 'Numark' in February 1975.

This established the usefulness of promotional activity for the chemist; other companies followed suite, Vestric, a national wholesaler, introduced the Vantage programme in 1975. These schemes led to much more aggressive marketing by pharmacies with the help of the wholesaler who negotiated special promotional prices from manufacturers on behalf of their customers, supplied advertising material and sponsored advertising.

The collapse of R.P.M. at the wholesale level

Unichem was a chemists' co-operative largely concerned with O.T.C. distribution. It paid a dividend to its shareholders, but the increased activity in this range of products affected its turnover and it made a loss in 1971. From 1972 it changed its policy and moved into the distribution of 'ethical' and proprietary medicines, introducing in 1974 a new discount scheme. This gave a discount on non-medicinal purchases (which were not price-controlled) calculated with reference to total purchases, so in effect giving a discount on ethical pharmaceuticals.

Discounting was slow to develop, but by 1976 most wholesalers were operating some form of discount scheme based on non-medicine purchases, although sometimes the purchases seem loosely controlled.

This affected many of the major distributors. Sangers reported a 33% drop in profits in 1977, made up of loss in business and a reduction in gross profit by giving discounts. In June 1978, after running a campaign warning of the impending dangers in allowing discounting to continue (which had little effect), Macarthys introduced a revised scheme which gave a discount on non-medicines but clearly based on total purchases.

A number of major manufacturers took action and discontinued supplies or threatened to do so. However they acted too late and events overtook this attempt to reverse the position. The final act was in July 1979 when Vestric, a wholly owned subsidiary of Glaxo, who had not discounted and so lost a great deal of business, introduced a discount of 10% on all purchases over £1,000.

It was not long before the effects of discounting became apparent. Unichem announced their results for 1979, sales had increased by 36.8% and the profit allocated to members increased from £2.2 million to £8.2 million; a measure of their level of discount. Other wholesalers announcing their results also showed an increase in turnover, part of this increase being due to retailers switching their direct business to wholesalers. Macarthys were up 31% but their profit had fallen 17%; Sangers also showed an increase in sales to £115 million but profit as a percentage of sales fell to below 1%, the lowest figure for ten years.

This pattern of increased turnover and reduced profit was repeated throughout the industry. A contributing factor was the number of small wholesale branches that the major companies had open in the past ten years. These had been profitable with a 15% margin and had given excellent service with short lead times, but the market was now changed.

Now, customers were intent on getting the best discount, and to do this reduced the number of

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wholesalers with whom they dealt, using one company as a main supplier, in order to maximise their discount. Most customers were happy to accept a maximum delivery of twice a day. The wholesalers' small 'ethical' branches were expensive to operate and their main advantages of frequent deliveries and a short lead time were no longer important.

Drastic action had to be taken. Deliveries were reduced from four or six a day to a maximum of two, strict credit terms were introduced with a limit of thirty days after the end of the invoice month. If this were exceeded discount was withdrawn. Small accounts were more expensive to service and the discount schemes were so structured as to give no discounts on accounts of less than £1,000 each month. The larger multi-branch companies started to close their smaller branches and to service the area from a distant major branch.

The pressure on wholesalers continued. A number of manufacturers reduced the wholesale margin from 15% to 12.5%, and some incorporated a settlement discount so that payment had to be made promptly to gain the full amount. Some wholesalers reacted by charging a notional price adding back their 15% discount, arguing that with their discount schemes, the retailer was still buying below list price. The scheme was attacked by the manufacturers and the retailers, but the weakness was that all wholesalers did not join; it was withdrawn in January 1981.

The Department of Health watched these developments carefully. There was a clawback aimed at recovering the extra discounts the pharmacist received by careful buying; this did not take into account the extra discounts that retailers were now receiving from wholesalers. In June the Department increased the clawback to 5.44% so as to include the wholesalers' discounts. Unichem gained a distinct advantage by declaring that as their rebate was part of the profit-share paid to its members, it was not a discount and could not be recovered. They gained many new members before a hearing in the High Court in July 1982 ruled there was no difference between a discount and a profit-share.

The major wholesalers continued to re-organise their businesses, closing smaller branches; some well known companies were closed, others sold out to competitors. A measure of the contraction may be gained from the number of depots operated by members of the then National Association of Pharmaceutical Wholesalers (N.A.P.W.) These were reduced from 184 in 1978 to 107 in 1984, a 42% reduction. Fortunately pharmacists appreciated that price was not the only factor but had to be balanced against a regular service and a wide stock range, consequently Unichem did not dominate the market on price.

The influence of Europe.

There were other problems for wholesalers. Because of their membership of the European Economic Community (E.E.C.), the member states had to bring their legislation into line with Community practice. One element of this was the concept of the free movement of goods between members; this was tested by Centrapharm, a Dutch company. It imported Negram manufactured by the Sterling Drug Corporation into Holland from the United Kingdom because the selling price was less than half the Dutch price.

Sterling successfully challenged Centrapharm on the grounds that they had an exclusive marketing arrangement for the Dutch market. Centrapharm appealed to the European Court who disagreed with this judgement, saying it was in contravention of the European rules of trade. Another case was also decided in Centrapharm's favour in 1976 which established, that in principle, pharmaceuticals could be freely traded across European borders.

By 1981 there was a change in the balance of prices. Prices had risen in the United Kingdom at a greater rate than in the rest of Europe and many European prices for medicines were now below the U.K. price. The Medicines Act made it clear that no medicinal substance could be sold unless the manufacturer held a licence for its manufacture, and the distributor held a Wholesale Dealers' Licence, although there was little difficulty in obtaining the latter.

There was a growing volume of imports into the U.K.; two importers were prosecuted and fined. Owing to conflicting statements from the authorities there was some confusion about the current position, partly due to the Department of Health, who wanted to prevent poor quality or counterfeit material entering the country, at the same time avoiding restrictions on imports conflicting with European rules.

In December 1983 proposals were made to regulate parallel imports. All the members of the British pharmaceutical industry were very anxious that legislation should be introduced promptly, but time passed and no conclusion was reached.

During this time pharmacists bought imports at a substantial discount and were reimbursed for dispensing at the full price, so making extra profit. The Minister of Health announced in November 1984 that he was introducing an endorsement scheme for parallel imports. Pharmacists buying medicines for dispensing at a discount of 12% or more had to endorse the prescription. They would then be reimbursed at 80% of the Drug Tariff price. The scheme was challenged by a group of importers who won their action on the grounds that it discriminated against imports; so it had to be withdrawn.

Eventually in May 1985 the Medicines (Exemption

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from Licences) (Importation) Order was introduced. This required an importer to obtain a licence before supplying a medicine already on the market. A number of safeguards was introduced including the proper labelling of imported medicines. This was a step forward but there was evidence that the regulations were being flouted as parallel imports continued to be offered for which no licence had been issued.

The comprehensive wholesalers suffered from what was considered unfair competition as they were not prepared to handle unlicensed parallel imports. Some sources were suspect and there was evidence that counterfeit material had been offered. There were incidents where patients were harmed because of incorrect labelling and by dubious material. The majority of parallel importers were small, short-line distributors who stocked only a limited range of fast moving prescription items on minimum terms; by the nature of their business their costs were low.

The only positive factor was a limit to the volume of supplies available, most supplies being diverted from Continental wholesalers and there was a limit to the amount they could obtain above their normal requirements. Once the licensing system was operating effectively, over a period a number of the larger importers established themselves as suppliers of quality material which they could guarantee. Wholesalers were then able to stock a range of imports and begin to recover some of the large volume of turnover they had lost.

Wholesale standards.

The Wholesale Dealers Licensing scheme was introduced under section 8 of the Medicines' Act 1968. Parallel importers had no difficulty in obtaining licences and the comprehensive wholesalers were concerned that the licensing scheme was ineffective in controlling standards. Retail groups were applying for licences so that they could purchase direct at wholesale terms, and the system encouraged companies (who otherwise had no interest in wholesaling) to apply for a licence and concentrate on short-line distribution of fast moving lines. A measure of how far this had spread was seen at the end of 1983 when there were appoximately 100 *bona fide* comprehensive wholesalers and over 1,500 licences had been issued, including manufacturers' distribution facilities.

While wholesalers were concerned at the growing erosion of their market, the Department of Health was more concerned that pharmacists were making considerably more profit than the reimbursement scheme had intended. To redress the balance they introduced on 1 August 1983 an immediate 2.5% reduction in all pharmaceutical prices. This was achieved by instructing all manufacturers to reduce their prices to retailers by 2.5%. Consequently at a stroke all the wholesalers' stock was reduced in value, calculated as being equal nationally to £2.5 million. During discussion it became obvious that no one had realised the effect on wholesalers. A compromise was agreed and manufacturers credited the difference between the old and new prices on the equivalent of two weeks purchases, but this still left a loss to be borne by the wholesalers.

This incident made it clear that the Department had little understanding of the problems or the role of the wholesaler. It was obvious to members of the trade association (then the National Association of Pharmaceutical Distributors, (N.A.P.D.) that they had to play a much more active role in promoting their members. They carried out a survey of members and on the basis of the results proposed to the Minister a new code of practice to be adopted by all pharmaceutical wholesalers.

The main elements of these proposals were that wholesalers would introduce tight control over conditions of storage and distribution, ensure that there was a stock rotation, that temperature sensitive products were properly stored and handled, and there would be good records and staff training. In return full-line wholesalers expected to be granted wholesale terms of 12.5% to compensate for costs in carrying a full range, including slow moving items, and maintaining their service. Other wholesalers who were mainly short-line suppliers with lower costs would be granted 7.5%.

The Department did not accept this proposal, but in order to gain an insight into the financial structure of distribution the Government set up a working party in 1986 under the chairmanship of Sir Kenneth Clucas, bringing together representatives of the Government, manufacturers, chemist contractors and wholesalers. This was a useful exercise as it gave the wholesale representatives an opportunity to show to the other members that the full-time wholesaler was providing a valuable service to pharmacists and hospitals. The group had its last meeting in February 1987 and the report was presented to the Minister of Health, Tony Newton.

David Sharpe of the Pharmaceutical Services Negotiating Committee (P.S.N.C.) said that one result would be a 2% reduction in the wholesalers' margin. The author in a speech to the Vantage Convention that year pointed out that reducing the margin was not a solution to the excess profits pharmacists were making because of wholesalers'

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discounting. Negotiations by the Department with pharmacy contractors on the reimbursement price ought to be quite separate from those with wholesalers on their margin.

The report was not published but had considerable influence on the future action of the Department, who now had a much clearer idea of the wholesalers' role. One result was adoption of a voluntary code of practice by all members of the wholesalers' trade association. This gave the inspectors concerned with granting wholesaler dealers' licences a yardstick, and coupled with the regulations on wholesale standards developed by the E.E.C., resulted in raising the standards of pharmaceutical wholesaling and tightening-up of the granting of licences. This benefitted the comprehensive wholesalers who had developed efficient systems and records.

Unichem floatation.

Unichem, the only national co-operative wholesaler, announced in January 1988 that they were going to convert to a public company and float their shares on the Stock Exchange in 1990. They forecast that their £1 shares would be worth £12 and members were to be allowed to increase the number of shares they held. Shares were allocated on the basis of monthly purchases, pharmacists having to maintain a minimum monthly account of £7,000 to qualify. New members were also encouraged to join provided they maintained purchases at this minimum level.

The announcement had a significant effect on the market. Many pharmacists joined Unichem for the first time and members increased their purchases, so reducing the turnover of others. Macarthys reacted by proposing to bid for Unichem, believing the two companies would be stronger as one force, and sent out proxy forms to all Unichem members. Although they said 25% were returned, which would have allowed them to call an 'extraordinary general meeting', they did not take this further.

AAH, the other major wholesaler, asked pharmacists to take no action until they published an alternative scheme they would be introducing. Subsequently they published a statement saying they had taken legal advice and were advised that the Unichem share scheme was in breach of the Competition Act, and that any profit made on the shares at floatation would be subject to clawback by the Ministry.

Other complaints were made to the Government, and the Office of Fair Trading decided to investigate. Francis Maud, Under Secretary of State for Trade and Industry issued the statement, "My Department has obtained strict undertakings from Unichem to comply with the relevant statutory provisions in future .... I have decided not to institute proceedings."

Other wholesalers were under considerable pressure to respond with some alternative. Many complaints were made about the structure of the Unichem scheme and the Monopolies and Mergers Commission examined the details of the proposed floatation. It was not until May 1989, seventeen months after the initial announcement, that the Commission ruled that the terms of the Unichem floatation were anti-competitive and against public interest. The scheme had to be stopped on 17 May but they ruled that the additional shares allocated to a customer could be awarded. This meant there was not only no redress for other wholesalers who had suffered loss of custom, but as fewer shares would now be issued than forecast, the value would be increased.

Unichem went public in 1990. Members were awarded ten shares for every one they had held, and other bonuses raised the share price to £16, a good return for their original investment. Unichem had by this ploy expanded and now controlled 30% of the market

Conclusion

The wholesale market changed radically between 1950 and 1990. There were two main factors, the N.H.S. and the introduction of new drugs which expanded the market, and the collapse of R.P.M. among wholesalers forcing them to modernise, the costs of which favoured the larger companies who took an increasingly larger share. Parallel importing led to better control over wholesaler dealers' licences and self regulation has improved the industry's image.

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Sugar in the Middle Ages

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In this article on sugar, emphasis is put on how much sugar, at what price and for what purpose, it was consumed in the England of the late Middle Ages, that is until 1500 when sugar cane was introduced into the West Indies.

Furthermore, Professor Trease has written, "It was, however, the introduction of sugar which produced the greatest single change in mediaeval pharmacy".[1] So the study of sugar history is very relevant to pharmaceutical history. If one examines the original documentary sources one soon realises that sugar did not become important and readily available **only** after the sixteent century; its importance was **not** just the figure for average consumption obtained by dividing the sugar available by the total population at any one time.

It would also be misleading to assume that sugar was used for only the same purpose as today. When we read (See Fig. 1) that a Tonio Taragagno bought 15½ ozs. of white sugar between 10 July and 27 August 1356 we should not assume it was just to sweeten his coffee - which had not been introduced into Europe by that date anyway.

Sugar was used in cooking as a spice in the same manner as other spices in order to give flavour; it was also the raw product for sweetmeats and confectionary, as well as an important component of syrups and electuaries.

In order to obtain the right perspective of sugar's importance in mediaeval society, the prices for sugar are compared in this article with those of other spices and with the other popular sweetener, honey.

Sugar, unknown in Europe prior to the Crusades, was already a source of food to the people of China and India. The Crusades of the eleventh to the thirteenth centuries led to a better knowledge in Europe with the customs of the Arabs, including their use of sugar in pharmacy and cooking. By the tenth century, sugar cane was grown in Mediterranean regions, such as Syria, from where it spread into Egypt, Cyprus, Rhodes, Malta, Crete, North Africa, Sicily and Spain.

Sugar destined for England before the fourteenth century came by the regular trade with the Italian ports such as Genoa and Venice, then travelled overland to the great fairs of Champagne, or to Bordeaux in Aquitaine, then an English possession.[3] In the next century Italian and Portuguese merchants and ships were active in importing sugar to England. Its commercial distribution was then the domain of the spicers who are recorded in England by the thirteenth century. Grocers begin to be mentioned in the middle of the fifteenth century and apothecaries some fifty years later.

European pharmacy, affected by contact with the Arabs, began to emerge in the twelfth century gradually spread northwards from Sicily, Spain, Italy and southern France. Some sugar-based medicaments contained potent substances, but many were more of the nature of sweetmeats containing ginger, almonds or pine kernels. Sugar was increasingly used in England from the middle of the thirteenth century for candied fruits, gingerbread, nougat and barley-sugar (penidius), prepared and sold by spicers.[4] Sugar including sugre rosee and sugre caffatyn, was recommended in numerous English medicinal preparations of even the twelfth century.[5]

Examples from the accounts of the royal spicers in England in the mid-thirteenth to early fourteenth centuries give the following prices for different qualities of sugar.[6]

Year	Quantities in lbs	Sugar Quality	Cost	Price per lb
1242	30 lbs	Pulveris Albi	28s.2d.	11.3d.
1242	9 lbs	Pulveris Albi	9s.0d.	12d.
1242	10 lbs	Zucar	10s.0d.	12d.
1252	13½ lbs	Pulveris Albi	11s.5d.	10.2d.
1252	16½ lbs	Pulveris Albi	13s.9d.	9.3d.
1253	14¾ lbs	Pulveris Albi	12s.3½d.	10d.
1253	9½ lbs	Pulveris Albi	7s.11d.	10d.
1265	8½ lbs	Pulveris Albi	5s.8d.	8d.
1265	3 lbs	Pulveris Albi	2s.0d.	8d.
1265	11 lbs	Pulveris Albi	7s.4d.	8d.
1265	3 lbs	Pulveris Albi	2s.0d.	8d.
1265	5 lbs	Zucar Alexandria	4s.2d.	10d.
1301	4 lbs	Succre	10s.0d.	30d.
1301	6 lbs	Succre	15s.0d.	30d.
1301	3 lbs	Succre	7s.6d.	30d.
1306	136 lbs	Pulveris Albi	£10 4s.	18d.
1306	106½ lbs	Pulveris Albi	£10 13s.	24d.

As is evident, sugar was sold by the pound weight and at least up to 136 lbs at a time. Prices could vary from one to three times its value within a short period of time, but generally speaking prices decreased as the years advanced.This may be seen by the average retail price of white sugar in England as shown in another study:[7]

Years:	1259-71	1281-90
Price:	16.50d/lb.	9.25d/lb.

For purposes of comparison, cinnamon sold at 10d. a pound in 1252 and 1253, and cloves at 10s. to 12s. a pound in 1251 and 1262.[8] At the end of the thirteenth century a skilled worker such as a

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carpenter or a mason was paid 3d. to 5d. a day; a hen cost 1¼d. and a pig about 3s.[9]

Great quantities of sugar went into making spiced wines, the preparation of which was an important duty of the mediaeval spicer/apothecary. Private household accounts as far back as 1265 throw light on daily food expenses, including sugar. The accounts of English baronial households in the thirteenth century included besides sugar, such mediaeval luxuries as rice, almonds and dried fruits, all of which were reckoned as being in the spice account.[10]

On the household roll of Eleanor de Montfort one reads for instance:

"For 12 lbs of sugar, 12s.

"For 6 lbs of powdered sugar with mace, 6s."

The Countess of Leicester's account mentions both ordinary sugar, which may have been the less expensive loaf sugar which had to be pulverised, and powdered white sugar. Sugar was 1s.a lb. in April 1265 but the price had risen to 2s. by the end of July. Although its cost was not exhorbitant the quantities were not very large. Over the whole seven months of the account there were only some 55 lbs of sugar bought, whilst 53 lbs of pepper were over the same period. Any additional sweetening was probably with honey made by the bees kept in the precincts of the castle.

Other entries from her accounts make interesting comparisons:

60 lbs. of almonds	12s.6d.	i.e.2½d. per lb.
6.lbs. of ginger	15s.	i.e.2s.6d. per lb.
8 lbs. of pepper	18s.8d.	i.e.2s.4d. per lb.
6lbs. of cinnamon	6s.	i.e.12d. per lb.
1lb. of saffron	14s.	
1lb. of cloves	14s.	
1½lb. of zeodary	2s.	

The spice, sugar, was less costly than saffron, ginger or pepper, the most commonly used spices, and about the same as cinnamon. Despite its price even saffron at between 10s. and 14s. a pound was also a popular ingredient in many mediaeval recipes.

The purchases of sugar could be very large. The accounts of Bishop Swinfield's household in 1289 mention for example the purchase of more than 100lbs of sugar, mostly in coarse loaves, also liquorice and 12lbs of sweetmeats. When Thomas, Bishop of Exeter, died in 1310 he left 77lbs of sugar which sold for £3 17s.2d., roughly 1s. a pound.[11] It has to be kept in mind though that most of these wealthy households consisted of many people.

The quantity of sugar consumed increased steadily from the mid-thirteenth century, and by the early fourteenth had reached considerable proportions. It used to be thought that sugar was unknown until later in the Middle Ages and that only honey was employed for sweetening but study of the accounts shows that it was in continuous use in wealthy households by the middle of the thirteenth century.

Many household books from late mediaeval times have been transcribed, but unfortunately comments and interpretations are usually lacking or insufficient to give a clear understanding of the transcription.

After the Conquest in 1066 the legal language in England became Norman French and many poems and household records were written in it. A poem by Walter de Bibbesworth shows the general use of sugar in the preparation of meals.

"Puis averent coins en grave,

Trestut de zugre enfundre, ..."

which translated means: "Afterwards they had rabbits in gravy, sprinkled with sugar", and elsewhere it has: "Ove zucre roset la temprure", or "Permeated with rose sugar". [12]

This shows that in the same way as other spices, sugar was used to give taste to various dishes including meat ones.

In 1286 the sum of £1,775 was spent by Edward I on medicinal spices, 677 cakes of sugar and over 2,199 lbs. of flavoured sugar, most of which went towards the making of electuaries, syrups and other nostrums.[13]

A bulk shipment of sugar to England took place in 1319 when a Venetian, Thomas Lauredano, shipped 10,000 lbs of loaf and 1,000 lbs of candy sugar.[14] Purchases of sugar accounted for a substantial proportion of the money spent by successive Royal Apothecaries, and made the Italian factors trading in England extremely rich.

A merchant in Italy

Recently the sales of an Italian grocer in a fourteenth century day-book have been transcribed and published.[15] (See Fig.I) The frequency of sale of various goods by that 'spezeria' in the medium sized town of Imola in northern Italy corroborates the observation made a century later by Jean de Renou (1568-1628) of France, physician and adviser to Henri IV, "Sugar, oil, war and honey are the four pillars of an apothecary."[16]

A compilation of all the sales made by the Imola spicer from March 1356 to October 1367 shows that sugar of various qualities and quantities was sold 132 times (adding in confectionaries made it 155), whilst honey was sold 137 times. Seven different varieties of sugar were stocked but it was the best quality of white sugar which was mostly sold. The customer had the choice of high grade

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A di x de luglo 1356

Tonio Tartagno, per oncia 1 de diacimino soldo 1, denari 4; una candella de cira denari 4; libra ½ d'ollio da ardere denari 10; oncia 1 de çucharo bianco denari 20; 1 oncia de manuschristi con perle e 1 oncia de zucharo bianco a di XVIIJ luglo soldi 5 denari 2; libra 2 d'ollio da ardere a di XVIIIJ soldi 3 denari 4; 1 oncia de zucaro bianco soldi 2; 2 oncie zucaro bianco: soldi 3 denari 4; 1 oncia de çucharo bianco e oncia ½ de spiecie dulçi soldi 3 denari 3; oncia ½ de peniti denari 6; ¼ de peverada, ¼ de spiecie dulçi, una otava de çafarano e per mortida soldi 3 denari 8; oncia ½ de çucharo bianco e oncia ½ de piniti a di ultimo soldo 1 denari 4; 1 oncia de çucharo bianco e oncia ½ de piniti a di primo d'agosto soldi 2 denari 4; 1 oncia de çucharo bianco denari 20; per mele roxado denari 2; oncia una de çucharo bianco a di VIJ d'agosto denari 20; libra ½ d'olio da ardere e 2 oncie de candelle de cira soldo 1 denari 10. Ane dato Tonio predito a di XXVIJ d'agosto libra 3.

Figure I.

From the daybook of a spicer in Imola, Italy in the fourteenth century

Egyptian sugar,white sugar, sugar 'musato' (poor), sugar pieces and red sugar containing molasses used for confectionary. The price also varied with the quantity sold, ounce quantities sold at twenty *soldi* and a pound weight for only seventeen *soldi.*

Sugar became an important spice in Italy, commanding about the same price as pepper, and became accessible to a large section of the population. Additional proof for this is given by an illustration in an Italian manuscript which shows street vendors selling sugar exclusively.[17] The picture shows baskets filled with lumps of good quality sugar, several of which are aligned on a stick and carried on the shoulder of the street vendor. This sale of sugar in the streets was common in Florence in the fourteenth century.[18]

While sugar was bought in quantities from half an ounce to a few pounds at a time at 20 *denari* the pound, honey was sold in ½ lb. to 160 lb. lots at 6 to 12 *denari* per pound. On a weight basis sugar was 20 to 40 times more expensive than honey in fourteenth century Imola.

Like sugar, other spices were sold in ounce quantities, for example pepper which was about the same price or aniseed which sold at one to two *denari* an ounce. An ounce of almonds was two *denari* usually purchased in ½ to 2 lb quantities. Saffron was four to six times more expensive than sugar, weight for weight. In the fourteenth century and throughout the fifteenth century, sugar manufacture developed into one of Sicily's most important exports.[19]

John, King of France.

During the Hundred Years' War , John, king of France was captured during the battle of Poitiers on 19 September 1356 and brought to England on 24 May 1358. Life in captivity was not too hard which is shown by the accounts for sugar of his household.[20]

Date	Quantity and cost of sugar	Price perlb.
5 July 1356	loaf sugar, 16lbs. 22s.8d.	17d.
5 July 1359	casson sugar, 25lbs. 31s.3d.	15d.
11 July 1359	sugar roset vermeil 3 lbs. 9s.	3s.
27 July 1359	loaf sugar, 5lbs. 6s.3d.	15d.
27 July 1359	sugar casson 12lbs. 13s.	13d.
27 July 1359	loaf sugar 26½lbs. 35s.4d.	16d.
5 Aug.1359	caffetin sugar 16lbs. 35s.4d.	25d.
5 Aug.1359	sugar casson 6lbs. 10s.	20d.
23 Aug.1359	loaf sugar 28lbs. 58s.4d.	25d.
19 Sept.1359	sugar casson 6lbs. 10s.	20d.
19 Sept.1359	caffetin sugar 16lbs. 33s.4d.	25d.
7 Oct. 1359	caffetin sugar 52lbs. 65s.	15d.
7 Oct. 1359	sugar casson 30lbs. 30s.	12d.
5 Nov. 1359	caffetin sugar 34lbs. 51s.	18d.
5 Nov. 1359	sugar casson 40lbs. 50s.	15d.
30 April 1360	sugar muscarrat 5½lbs5s.8d.	12d.
30 April 1360	sugar muscarrat 8lbs. 8s.4d.	12d.
30 April 1360	sucre enplate 4lbs.4s.4d.	13d.
30 April 1360	penites 1 lb. 13d.	13d.

Other items for the royal household cost

5 July 1359 ginger 1s. /lb.; aniseed 5d./lb. cinnamon 10s./lb.; cloves 2s.10d./lb.
17 July 1359 olive oil 2d./lb.
5 Aug. 1359 honey 1d./lb.

The last entry shows sugar to be 15 to 25 times as expensive as honey on the basis of weight.

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Sugar was bought (or else received) from different spicers, often the same type, on the same day. There were several sorts of loaf sugar, one of them being 'sucre caffetin' a white sugar of second quality, rounded at the top and sold in baskets. 'Sucre rosat' was a sugar crystallised from rose water. Sugar from Cyprus near Bafa and Limassol was regarded as the finest in the Mediterranean, and Muscarrat sugar was another sugar of high quality. Penites were drawn and twisted sugars like barley sugar, and already thought of as confectionary. 'Sucre plat' was one of the cheaper sorts of loaf, flattened at the top.

The fourteenth century epic of William Langland (c.1330 - c.1387) *Piers Plowman* has the lines:

"May no suger so swete
A swagen hit unnethe
Ne no diapendion
Dryve hit from myn herte."

Or another version of the first two lines is:

"May no sugre ne swete thinge
Asswage my swellyne...."[21]

Diapenidion was sugar based and used as an expectorant; at the time the poem was written sugar and diapenidion were household words. Bubonic plague or the Black Death had recently killed a high proportion of England's population, the pestilence affecting every social class and having a profound psychological impact.

The York Minster manuscript.

An old document on the use of sugar in a pharmaceutical context has fortunately been transcribed because the mid fifteenth century handwriting is very difficult to decipher. (See Fig.2.) The manuscript kept in York Minster Library is thin, having only 86 pages and looks very shabby. It was studied fifty years ago by a former librarian of the library and her work has been published in three installments in an American journal.[22]

This manuscript is really a book of herbs and medicines, and contains very detailed instructions on purifying sugar and how to make confectionary. A list of the sugar-based preparations is of interest:

f.9 To clarefye sugere.
f.9 To make annez in confyte.[i.e.sugar covered aniseeds]
f.11 To make canell in confyte frysed. [brittle sugar covered cinnamon]
f.14 To make sugere plate. [crystallised sugar]
f.15 To make penydes [stretched and twisted sugar like barley sugar]
f.16 To make Gobett Ryall. [royal tidbits, gobbets are little pieces.]
f.16 To make paste Ryall. [A very elaborate preparation with honey as well as sugar.]
f.17 To make penade Ryall.
f.17 To make conserve of madrian. [Madrian is a kind of ginger.]
f.18 To make madrian in confyt.
f.19 To make a sponge of sugere.
f.20 To make char de gwynce. [A jam]
f.21 To make Blance pouder.
f.30 To make conserve of roses.
f.31 To make electuarium de succo rosarum.

The practice of coating spices with sugar to make comfits, a favourite banqueting sweet, came from the idea that they aided digestion and had other medicinal properties. The following gives an idea of the length and the detail of these instructions:

"To make annez in confyte."

"Take 2 unces of fayre annez and put them in a panne and dry them over the fyre evermore steryng them with your hand till thai be drye put them out of the panne into a cornere and take up your sugere in a ladyll the mentenance of a unce and syte it on the fyre and stere the sugere with a spadyll of tre and whan it begynnes to boylle take a lytell upe of the sugere betwix your fynger and your thombe and whan it begynneth anythhyng to streme than it is soden ynogh than set it fro the fyre and stere it a lytell with the spatill and put thine annez than into the panne to the sugere and evermore stere in your panne with your flat hand... " and so it continues in great detail ending up by saying:

"...and in this maner schall e make caraway coryander fenell and all maner of round confeccions and zinzebar in confyte but your zinzeber must be kutt lyke a dyse in smale peses 4 square and gyfe that zinzebar a lytell hyyer decoction than you gefes thine other sedes."

Fig.2 reproduces one of the more legible portions of the manuscript and pertains to the instruction, "To clarefye sugere".

"Take a quart of fayre water and put it in panne and therto the whyte of iii egges and take a brusche made of byrchen bowes and bete the water and the egges togedere tyll thai be resolved and kast grete scome abowen than but away yr brusche and put therto ii lb of sugere and mele all togedere and then sette it on the fyre on a ferneys ... and with that sugere ye may make all manere of confections."

It has been noted by E. Brunskill that there are great similarities between the York manuscript and parts of the manuscript Harley MS 2378. In fact it goes beyond mere similarities, some sentences are almost the same, word for word. The spelling differs sometimes, the Harleian version being in a south country dialect and the York MS in a northern one. Even the sequence of the preparations is identical

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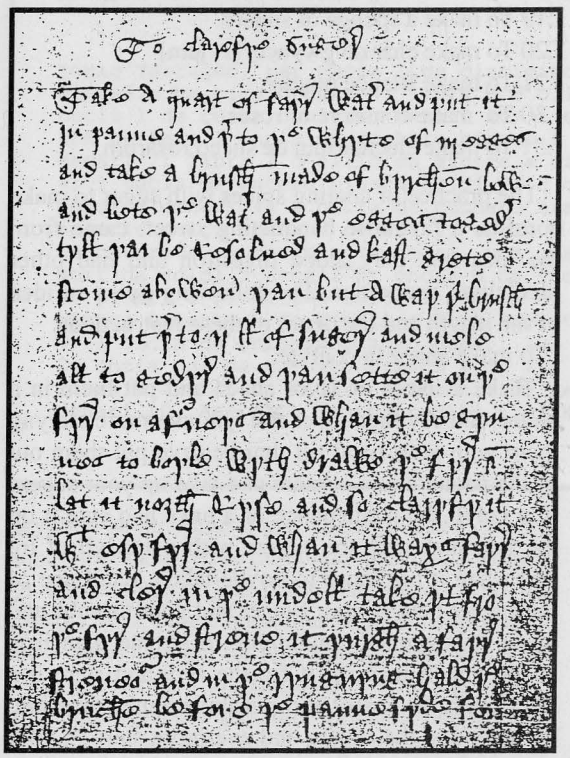
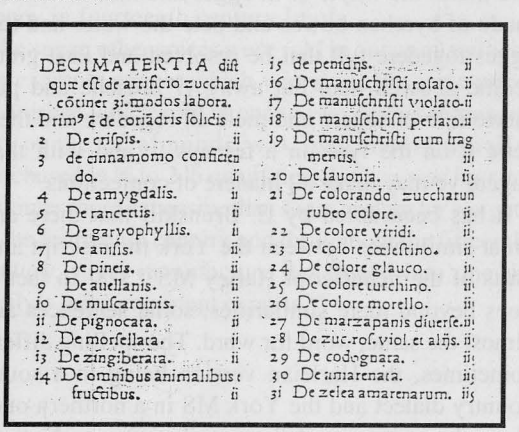
in both manuscripts. However the York one contains a larger choice of preparations than the Harleian.



How to clarify sugar, from the York Minster manuscript.

These mid fifteenth century recipes were not created in that century but were developed gradually, some remaining unchanged for three or more centuries. A part of an index to an Italian pharmaceutical treatise shows a great choice of similar preparations such as sugar coated nuts and spices, (see fig. 3) which is evidence of surprisingly good communication in the Middle Ages. Merchants, clergymen and scientists travelled extensively, acquiring, assimilating and passing on valuable information.



DECIMATERTIA dist
quæ eſt de artificio zucchari
cõtinet xi. modos labora.
Prim⁹ ẽ de coriãdris ſolidis ii
2 De criſpis. ii
3 de cinnamomo confician
do. ii
4 De amygdalis. ii
5 De rancettis. ii
6 De garyophyllis. ii
7 De aniſis. ii
8 De pineis. ii
9 De auellanis. ii
10 De muſcardinis. ii
11 De pignocata. ii
12 De morſellata. ii
13 De zingiberata. ii
14 De omnibus animalibus
fructibus. ii
15 de penidñs. ii
16 De manuſchriſti roſato. ii
17 De manuſchriſti violato. ii
18 De manuſchriſti perlato. ii
19 De manuſchriſti cum trag
mentis. ii
20 De ſauonia. ii
21 De colorando zuccharum
rubeo colore. ii
22 De colore viridi. ii
23 De colore cœleſtino. ii
24 De colore glauco. ii
25 De colore turchino. ii
26 De colore morello. ii
27 De marzapanis diuerſe. ii
28 De zuc. roſ. viol. et alijs. ii
29 De codognata. ii
30 De amarenata. ii
31 De zelea amarenarum. ii

Fig.3 The Italian index

The York manuscript had not been copied for the king and his court but rather for an educated gentry, showing that in the fourteenth and fifteenth centuries the use of sugar in England was already quite common. By the time of this manuscript the Portuguese had introduced sugar cane plantations into Madeira where it became an important crop. The development of this trade with Madeira and the Canaries caused the price of sugar to fall, and Tudor records show that it could be bought in London for 4d. to 10d. a pound.

The sweetmeats of the York manuscript were served with hippocras, a sweetened and spiced red wine. The preparation of such wines was an important duty of the mediaeval spicer- apothecary.

John Russel, gentleman-usher to Humphrey, Duke of Gloucester, in his *Boke of Nurture* (c.1450) wrote of the preparation of 'Yppocras' at length and in verse:[23]

"Good son, to make ypocras, hit were gret
lernynge,
And for to take the spice therto
Aftur the proporcionynge, Gynger, Synamone
Graynis, Sugur, Turnesole that is good colourynge.
For commyn peple
Gynger, Canelle, longe pepur, hony aftur
claryfynge...."

Another example in a mediaeval medicinal treatise is to be found in the well known 'Thornton Manuscript' in Lincoln Cathedral Library (MS 91), the *Liber de diversis medicinis*, which seems to have been written after 1422 but before 1453.[24] Examples of the use of sugar in this manuscript begin with :

"Take the leaves of spourge and a good portion of zucre....", or "Take ... twice als mekill suger ...."

Many similar medical works have survived in English, especially from the fifteenth century. Whether in French, Latin or English, a considerable number of anonymous medical works are collections of recipes which had existed for a long time.

Recently, many books on early cookery have been published indicating a continuing interest in old recipes. One soon becomes aware that there is hardly a dish in which sugar was not used, not only in sweets but also in meat and fish dishes.

Sugar however retained its medicinal value. It was seen as helping colds, coughs and lung complaints, and recipes for preserving fruit and flowers in sugar appeared in medicinal manuals rather than in a kitchen recipe book.[25]

The price ratio, sugar to honey in England, around 1400 was 20 to 1, but by about 1500 sugar was less than four times as expensive as honey on a weight basis, and even less if one takes into consideration the

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sugar content of honey. Deerr produced the following figures for the retail prices of white sugar and honey:[26]

	1400-10	1450-60	1470-80	1490-1500
Sugar	24.0d./lb.	14.3d./lb.	8.7d./lb.	4.3d./lb.
Honey	1.2d./lb.	1.1d./lb.	1.2d./lb.	1.3d./lb.

Sugar was by the end of the Middle Ages of importance in cookery, preserves and medicine, so it is not too surprising that Christopher Columbus (1451-1506) on his second voyage to the West Indies took sugar cane seedlings from the Canary Islands to Hispaniola (now the Dominican Republic.) He had married the daughter of the Portuguese governor of Porto Santo, Madeira, who owned sugar cane plantations there, so was well aware of its commercial importance.

Its use and value in medicine continued for many years. Andrew Boorde (1490-1549) in his influential *A Compendyous Regyment or a Dyetary of Healthe* (1542) recommended sugar in dishes such as cream and almond butter, "Almon-butter made with fyne suger and good rose-water, and eaten with the flowers of many vyolettes, is a commendable dysshe." He recommended sugar for the 'Melancoly man', writing, "These thynges folowynge doth purge Melancoly ... origanum, suger, and whyte wyne." He also recommended for those "in a consumpcyon ... All meates and drinkes the which is swete, & that suger is in."[27]

John Gerarde was probably aware of the writings of Andrew Boorde and in any case had a keen interest in all plants. He wrote "Of Sugar-Cane."

"It is a pleasant and profitable Reed, having slakes seven or eight foot high, joynted or kneed like unto the great Cane; the leaves come forth of every joynt on every side of the stalke, like unto wings, long, narrow, and sharpe pointed. The Cane ... is not hollow as the other Canes or Reeds are, but full, and stuffed with a spongeous substance in taste exceeding sweet. The root is great and long, sweeping along within the upper crust of the earth, which is likewise sweet ...."

He then continues "The Sugar Cane groweth in many parts of Europe at this day, as in Spaine, Portugal, Olbia, and in Provence. It groweth also in Barbarie, generally almost every where in the Canarie Islands, and in those of Madera, in the East and West Indies. My selfe did plant some shoots thereof in my garden, and some in Flanders did the like: but the coldnesse of our clymate made an end of mine, and I think the Flemmings will have the like profit of their labour."[28]

"This Cane is planted at any time of the yeare in those hot countries where it doth naturally grow, by reason they feare no frosts to hurt the young shoots at their first planting.

"Of the juyce of this Reed is made the most pleasant and profitable sweet, called Sugar, whereof is made infinite confections, Syrups and such like."

The first refinery erected in London was in 1544 but was not profitable owing to competition from Antwerp, and later Amsterdam became a rival.

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"Cannella d'Alessandria chi vende soldi 3 per 100,
Zucchero bambillonio chi vende soldi 3 del 100,
Polvere di Zucchero di Cipri chi vende soldi 2 per 100,
Cera di Romania paga soldi 2 del 100,
Cera Barberesca chi vende soldi 3 del 100"
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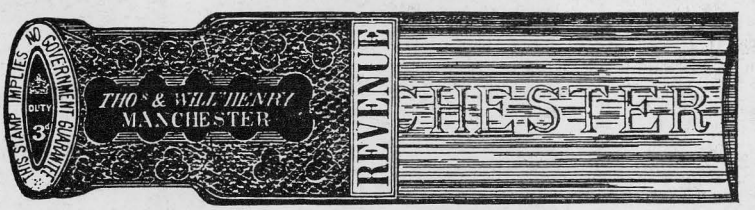

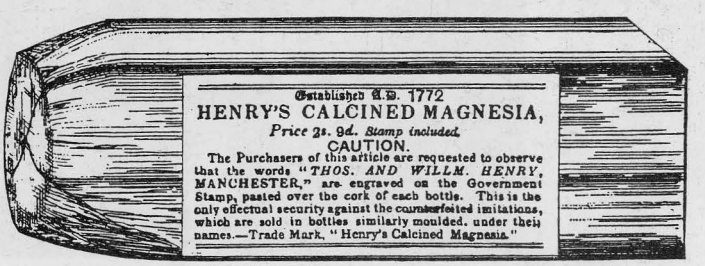

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